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OCTOBER 15, 1959
Price 50c

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the telephone industry magazine

TELEPHONE ENGINEER & MANAGEMENT 50th ANNIVERSARY 1909 1959 THE TELEPHONE INDUSTRY MAGAZINE

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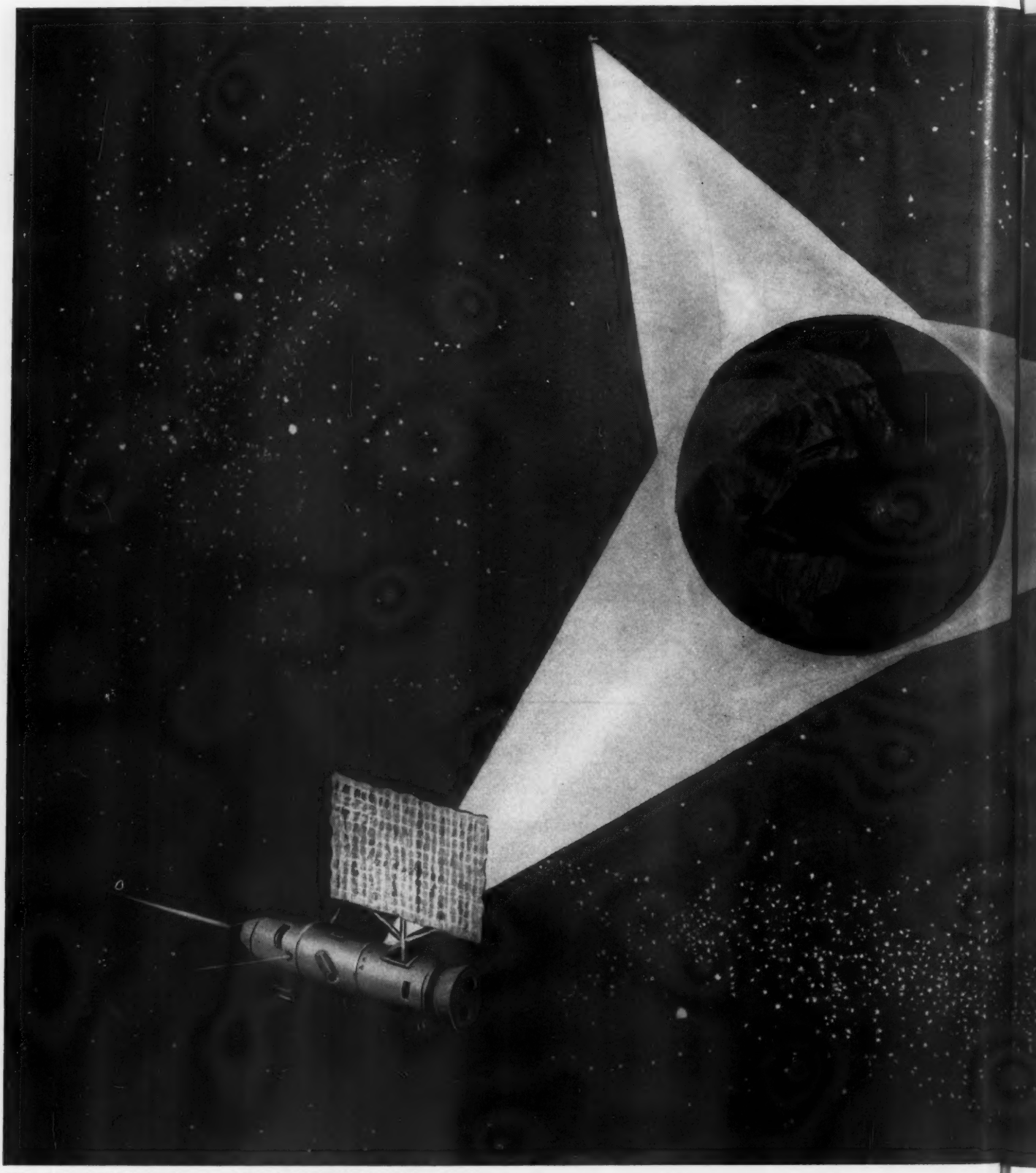
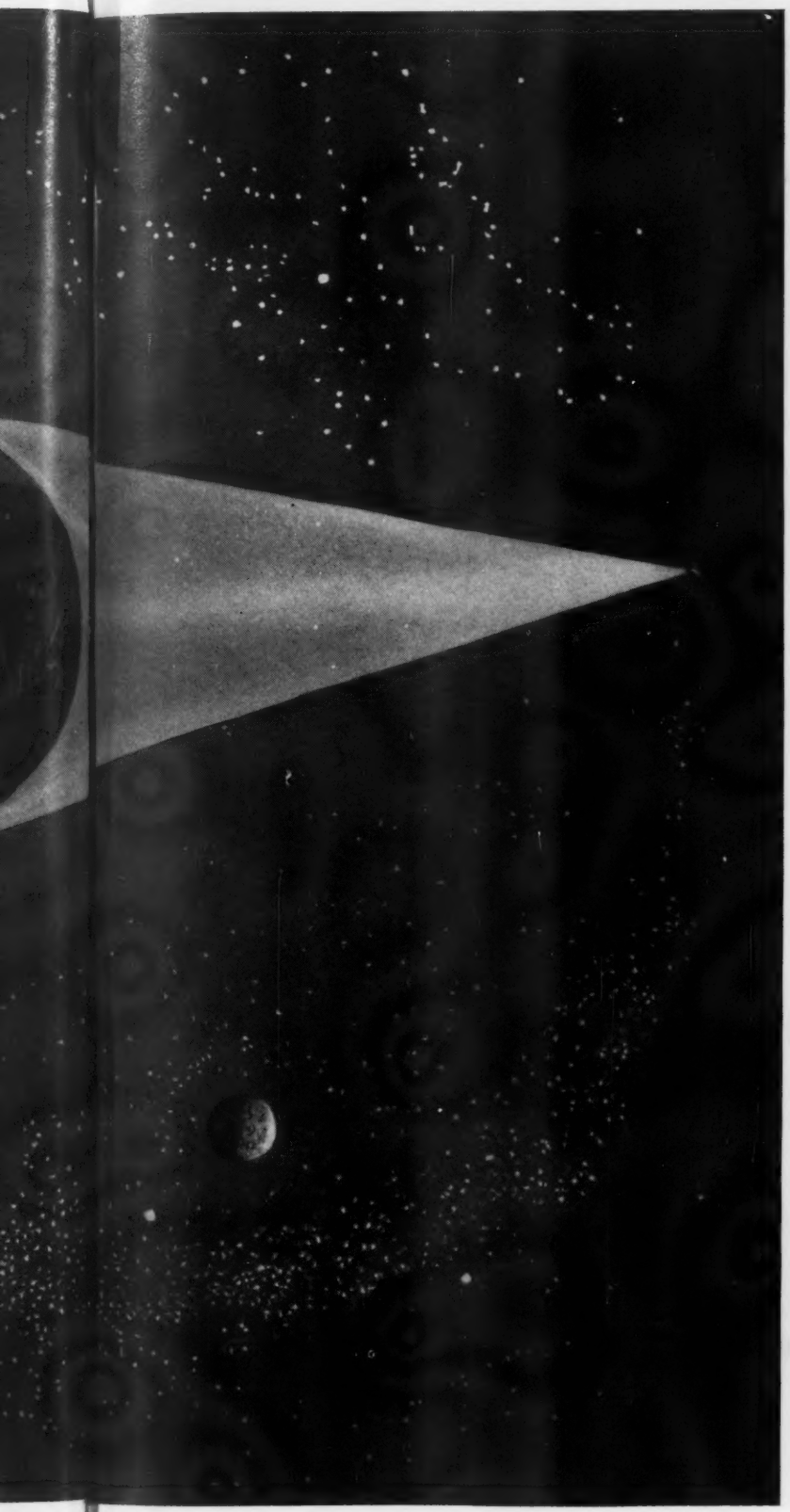


ITT's "Earth Net Dialing" system for global telephone calls via satellite relay.

...N for the expanding role of Telephony



ITT *Laboratories is now developing the "advance guard" of tomorrow's satellite relay system for world-wide communication and telephone dialing*

A VAST new dimension—reaching to outer space—is being created for telephony, to help relieve the world's overtaxed communication resources.

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One of ITT's advanced concepts for speeding tomorrow's increased voice, video, and message traffic is the "Earth Net Dialing" system—a network of three unmanned satellites, 120 degrees apart in an equatorial orbit 22,300 miles in space.

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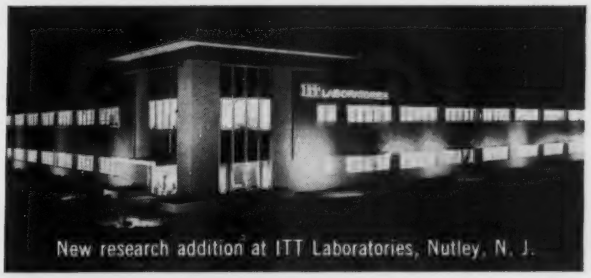
They symbolize the "years ahead" thinking and creative research that have made ITT's Kellogg Switchboard and Supply Company a valued contributor to the progress of independent telephony for 62 years.



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Published on the 1st and 15th of each month by
TELEPHONE ENGINEER PUBLISHING CORP.
7720 Sheridan, Chicago 26, Ill.

EDITORIAL STAFF

ROY F. SMITH
Publisher

JOHN G. REYNOLDS
Editor

DICK REYNOLDS
Production Mgr.

JANE KELLEY
Editorial Assistant

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ADVERTISING SALES STAFF

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Advertising Manager

BETSY MEYERS
Advertising Assistant

KEITH H. EVANS
& ASSOCIATES
3723 Wilshire Blvd.
Los Angeles 5, Calif.
Tel. — DUnkirk 8-2981

515 Market St., Rm. 225,
San Francisco 5, Calif.
Tel. — YUkon 2-4280

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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

OCT. 15, 1959

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FRONT COVER

Brownwood (Tex.) Mayor W. C. CARPENTER, left, presents a bronze plaque to D. T. STRICKLAND, vice president and general manager of The Southwestern States Telephone Co., at an appreciation dinner held in honor of the company. Approximately 140 persons attended the banquet. The plaque reads, "In grateful appreciation from citizens of Brownwood for the contribution made to the civic, cultural and economic life of our city by The Southwestern States Telephone Co. under your leadership. This plaque is herewith presented by the Brownwood Chamber of Commerce to D. T. Strickland, vice president and general manager, The Southwestern States Telephone Co." The company, which services 140,000 telephones in 160 exchanges in Texas, Oklahoma, Arkansas and Louisiana, has had its general offices in Brownwood since 1934.

Volume 63, No. 20. Published on the 1st and 15th of each month by TELEPHONE ENGINEER PUBLISHING CORP., 7720 Sheridan Road, Chicago 26, Ill. Telephone — ROgers Park 4-3040.
Subscriptions U. S. and Possessions, $4.00 per year; Canada, $4.50; in all other countries, $6.50. Single Copies, U.S.A. 50 cents.
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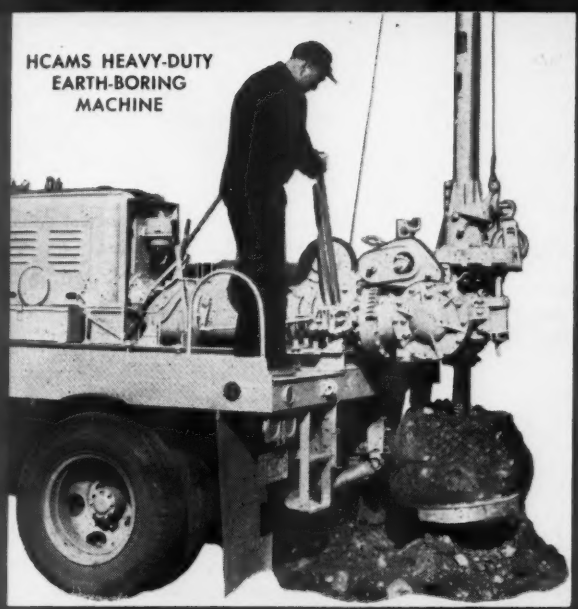
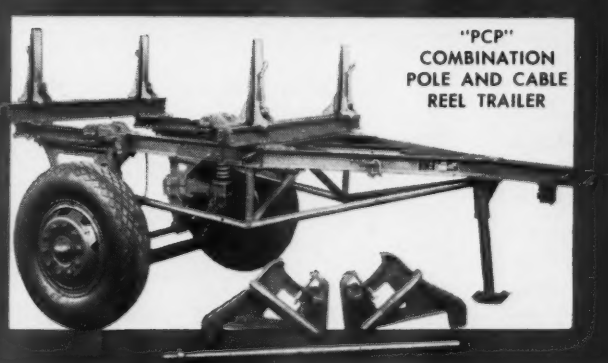


HCAMS HEAVY-DUTY EARTH-BORING MACHINE



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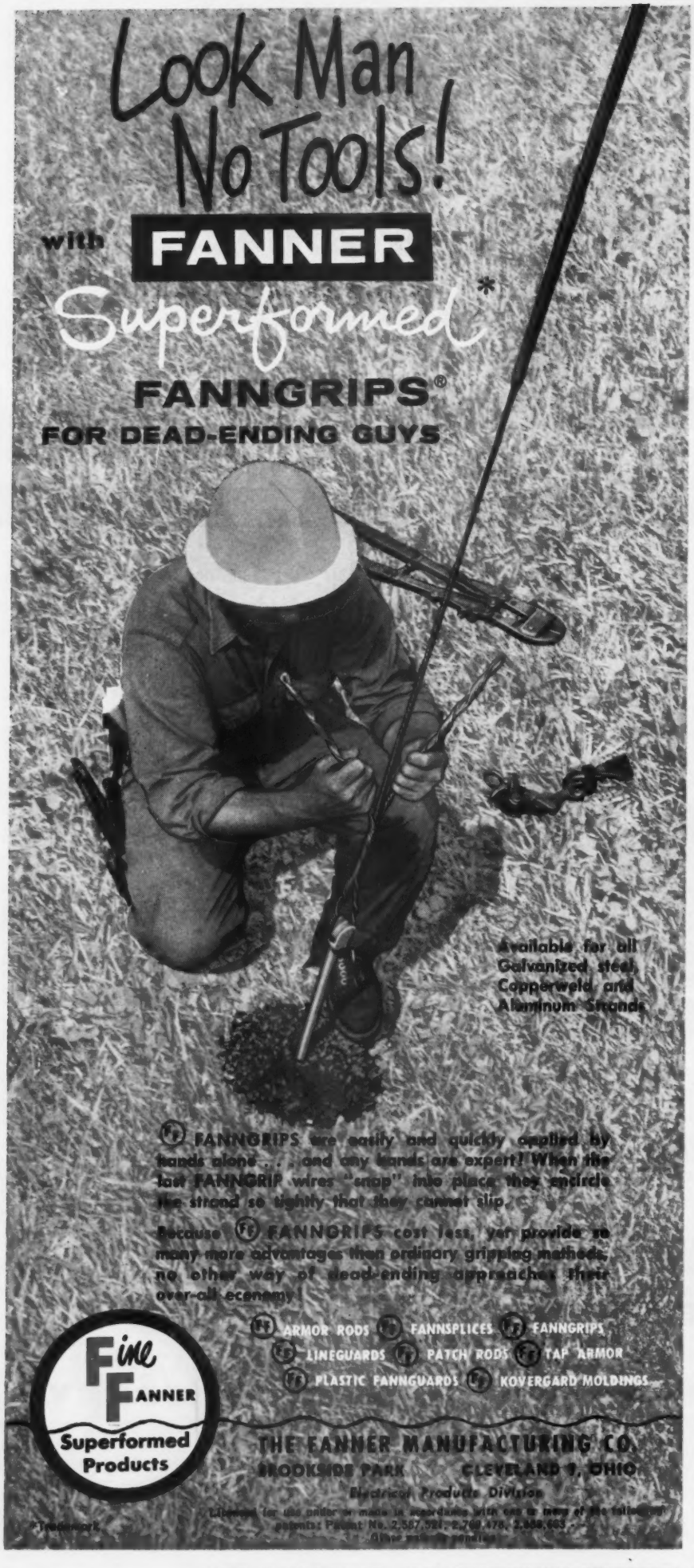
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CONVENTIONS

SOUTH CAROLINA Tel. Assoc., Clemson House, Clemson, S. C., Oct. 25, 26, 27, 1959.

VIRGINIA Tel. Association, Roanoke Hotel, Roanoke, Va., Oct. 29-30.

ALABAMA Tel. Association, Thomas Jefferson Hotel, Birmingham, Ala., Nov. 9-10.

GEORGIA Tel. Association, Dinkler Plaza Hotel, Atlanta, Ga., Nov. 11, 12, 1959.

OKLAHOMA Tel. Association, Skirvin Hotel, Oklahoma City, Nov. 18-19.

SOUTH DAKOTA Tel. Assoc., Marvin-Hughitt Hotel, Huron, S. D., Nov. 18-19, 1959.

FLORIDA Tel. Association, Robert Meyer Hotel, Jacksonville, Fla., Nov. 30, Dec. 1, 1959.

LOUISIANA Tel. Assoc., Jung Hotel, New Orleans, La., Feb. 24-25, 1960.

KENTUCKY Tel. Assoc., Phoenix Hotel, Lexington, Ky., March 1, 1960.

OHIO Tel. Assoc., Deshler Hilton Hotel, Columbus, Ohio, March 28-30, 1960.

IOWA Tel. Assoc., Ft. Des Moines Hotel, Des Moines, Iowa, April 5-6, 1960.

NEBRASKA Tel. Assoc., Hotel Not Announced. Omaha, Nebraska, April 19-20, 1960.

INDIANA Tel. Assoc., Claypool Hotel, Indianapolis, Indiana, May 4-5, 1960.

ILLINOIS Tel. Assoc., Abraham Lincoln Hotel, Springfield, Ill., May 19-20, 1960.

KANSAS-MISSOURI Tel. Association, Towne House, Kansas City, Mo., May 24-25, 1960.

PENNSYLVANIA Tel. Assoc., Bedford Springs Hotel, Bedford Springs, Pa., June 6-7, 1960.

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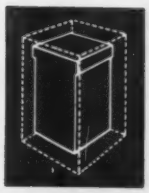
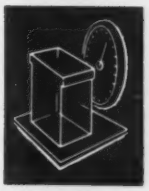
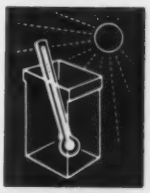


EASIER TO HANDLE. You will find it easier and quicker to move batteries in your battery room; shipping and handling costs are lower because of the reduced weight of these new batteries.



NEW PLASTRITE JARS NEVER LOSE SHAPE . . . never bulge or warp because Plastrite has 15 to 30% higher resistance to heat distortion and 50% higher elongation characteristics than other stationary battery jars.



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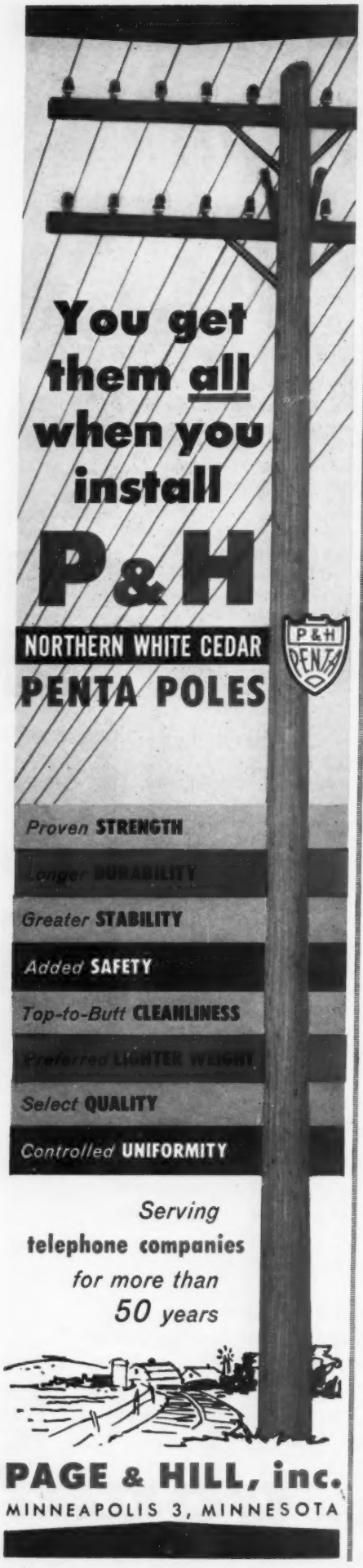


INDUSTRY OBSERVATIONS

by L. A. GRITTEN

"Unusual Rate Case In Oregon"

The recent rate case of the West Coast Telephone Co. set some precedents and offers definite proof of what can happen when a company objects to a commission's criticism of its service.

Criticism Overruled

THE WEST COAST Telephone Company's rate case in Oregon is unusual. It sets precedents and offers morals. Briefly stated, early in 1958 the company filed increased rates with the Public Utilities Commissioner of Oregon, calling for an annual increase in revenue of $834,000. Public hearings were held throughout the state. Messrs. Sloan, Cook and Lowe, Chicago consultants, were retained by the Commissioner to investigate the company's service. Their report was favorable: ". . . . West Coast Telephone Company is providing sufficient equipment of a high grade . . . . operated to good advantage . . . . comparable to that offered on the average by the best operating companies in the industry."

The P.U.C.O. order, issued on December 12, 1958, was one of the last orders signed by the then Commissioner; he vacated the office a few days later. His order cut the company's increase of revenue to $440,083. It contained the astonishing statement that because of ". . . . substandard service conditions and practices of record, the company's rate of return should be fixed in lower ranges of the zone of reasonableness." That was in flat contradiction of the objective findings of the Chicago consultants who were hired by the Commissioner himself.

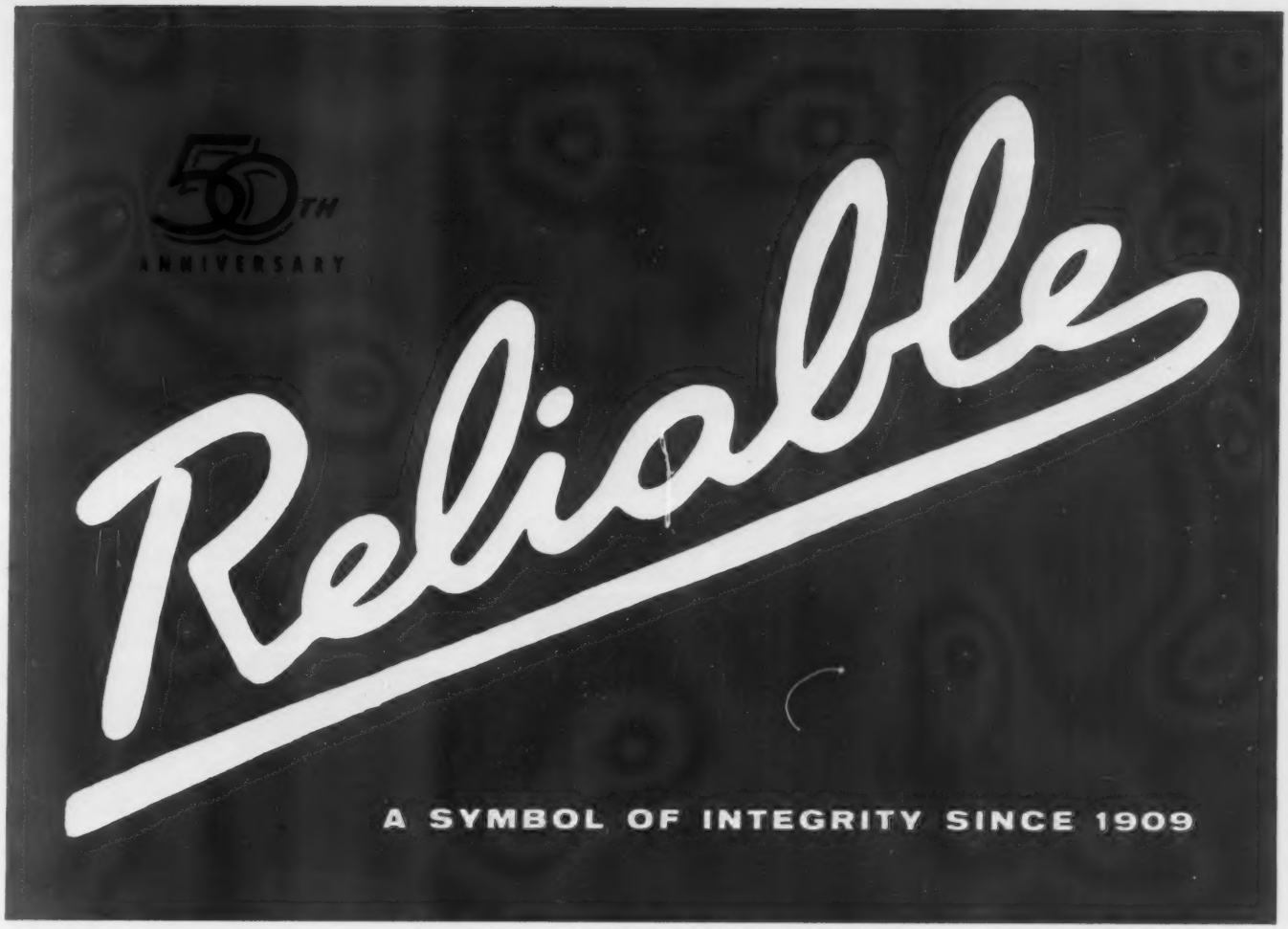
The company filed suit against the P.U.C.O. in Marion County Circuit Court, contending that 23 of the Commissioner's findings were not supported by the evidence and that the comments about "substandard service" were "erroneous, illogical and unlawful."

L. A. GRITTEN'S "Industry Observations" appear exclusively in "Telephone Engineer & Management."

Subsequently, the company informed Judge Val Sloper of the Circuit Court that rapidly improving economic conditions, and certain operating economies, had removed the necessity for the full amount of the rate relief requested in the April, 1958 filing. On this unprecedented motion, that part of the suit was dropped; but the company adhered to its objection to the P.U.C.O.'s criticism of the service.

Judge Sloper has ruled in favor of the West Coast Telephone Company, as having ". . . reasonably fulfilled an abnormally large demand for service." He exonerated the company from the charges of the former Commissioner.

This remarkable case indicates that unfair politico-regulatory criticism should not be allowed to go unchallenged. It also offers a sidelight on the economic boom in the areas served by West Coast, one of the most



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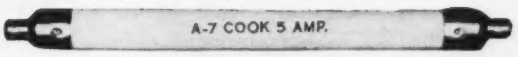

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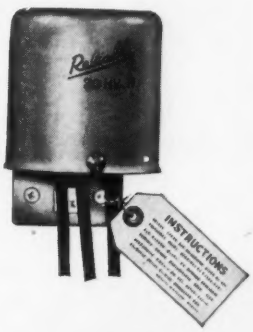

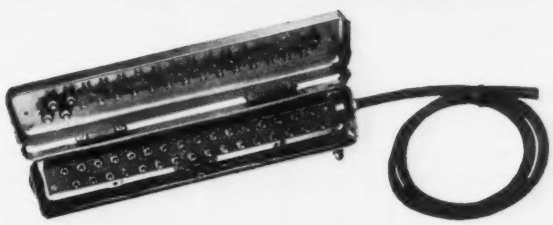

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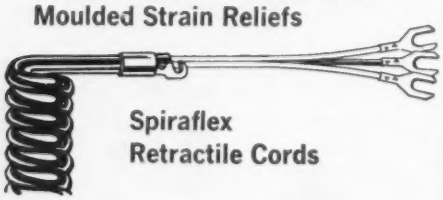

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ONE HUNDRED and thirty-two years ago, Georg Simon Ohm discovered that in a circuit of constant electromotive force, the current is inversely proportional to the resistance. We rediscovered that fact during a recent vacation trip. On occasion, we heat water in a plastic bucket with an electric heater. Usually it works perfectly. On this particular occasion, it blew a 20-ampere fuse. When that was replaced, it kicked out a circuit breaker. Then we began to recall what they told us at school, such as the resistance of water being lowered by the addition of mineral salts. Soap Lake, Washington, whence came our bucket of water, contains massive quantities of sodium, magnesium and other salts. Very good for rheumatism, so they say, but not recommended for use with an open-element 110-volt heater.

When Georg Ohm first propounded his law at Cologne, it was received with doubt. Too bad we were not there with our bucket to confound his critics!

* * *

Too Old At Thirty?

DR. EDWARD TELLER, "Father of the H-Bomb," believes in youth. Recently he said: "The chief contribution to scientific work is made by people between, say, 25 and 30." A cat may look at a king — and a telephone man may doubt a great scientist. We suspect that Dr. Teller's estimate must be at least ten years light, unless scientists are quite different from any other variety of mental worker. Only athletes and Casanovas are best in their twenties. — *L. A. Gritten.*

Editor's Note
To bring you the report on the recent USITA Convention we had to omit TE&M's regular feature departments. They'll be in the November issues.

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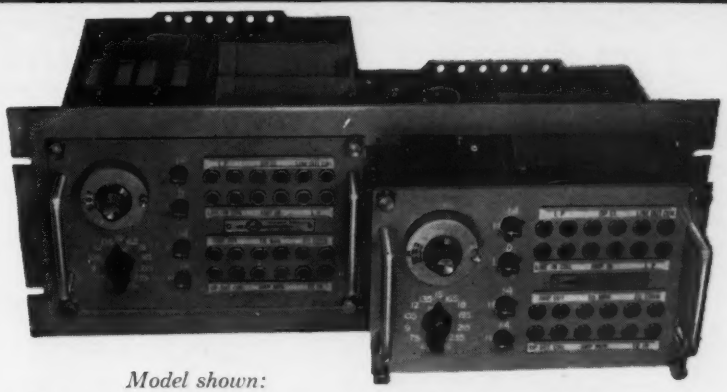
275 FAIRFIELD AVE., STAMFORD, CONN.

Cut line-up time from hours to minutes with Airtronics Packaged Program Equalizer



Model shown:
Twin-unit for rack mounting. Also available in single-unit models.

ALL POSSIBLE ARRANGEMENTS FOR USE ON 5, 8 OR 15 KC CHANNELS

Now, for the first time, here is a self-contained, packaged program equalizer. One that is specifically designed for operation on standard program-loaded or non-loaded communications cables and open wire, but may be applied advantageously to a variety of other circuits.

The Airtronics Program Equalizer has pre-tuned circuits in 1½ KC steps from 5 KC to 25 KC. You make all adjustments instantaneously by simple switch settings to desired frequency. Accurate equalization is achieved in minimum line-up time. A task now done in minutes which heretofore has been a tedious, time-consuming job for two skilled men.

Used with sweep generator techniques equalizing costs go down, down, down. Just three or four applications can save enough manhours to cover its modest price.

AIRTRONICS PROGRAM EQUALIZERS *are available in portable, wall mounting, or standard 19" or 23" rack-mounting arrangements. Rack mounting provides test and monitoring jack features. Special purpose equalizers available on order.*

Another Airtronics Product for the Telephone Industry

Airtronics Portable Test Hybrid is designed to use standard type 115 Precision Networks which are available in all toll offices.

Write today for full details on the Packaged Program Equalizer and the Model 20B Portable Test Hybrid Set.

A PRODUCT OF

AIRTRONICS INTERNATIONAL CORPORATION

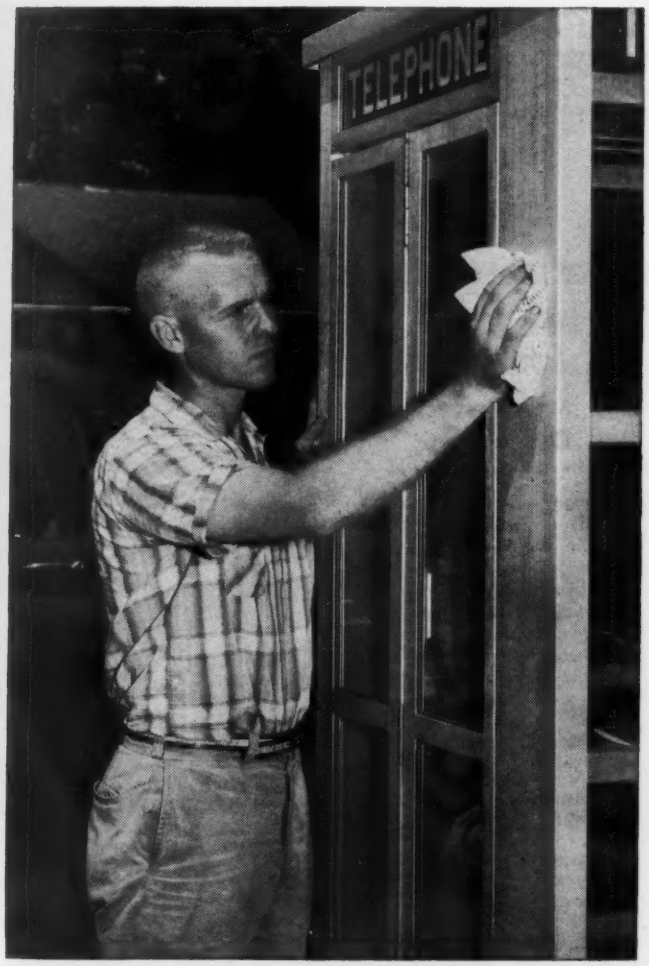
P.O. Box 8576, Fort Lauderdale, Florida (6900 West Road 84)

Added revenue from constant traffic at the roomy Alcoa booth in Oquawka, Illinois, pleases E. R. Watson, general commercial manager, Western Illinois Telephone Company.

"THIS ALCOA BOOTH PAID ITS WAY FROM THE START,"

reports E. R. Watson, Western Illinois Telephone Company

"Two years ago, we set up this Alcoa Aluminum outdoor booth in Oquawka, Illinois—a small fishing and resort town on the Mississippi—and it began paying for itself right from the day it was installed," declared E. R. Watson, general commercial manager for the Western Illinois Telephone Company.



"Maintenance is never a problem with Alcoa booths. A wipe with a damp cloth restores the aluminum to its original sheen, and the high-strength, solid Alcoa construction helps curb vandalism," says Mr. Watson.

"In peak vacation seasons, revenue from this one booth runs as high as $140 a month. People certainly seem to appreciate the convenience of outdoor booths and are attracted to the well-lighted and clean-looking Alcoa models. Like all 19 Alcoa booths on our system, installation was easy and maintenance is no problem. Routine sweeping and occasional washing are all that is ever necessary."

Telephone companies everywhere are discovering that Alcoa outdoor booths offer a sure way to gain additional revenue and customer goodwill. Their pleasing appearance, superior fluorescent lighting and larger interiors make them inviting to use. And the corrosion-resistant properties of high-strength, heat-treated aluminum give an unusually solid construction that assures profitable, long life investment.

FREE ALCOA GOODWILL KITS. Here's the big EXTRA that comes with every Alcoa booth. These free kits contain newspaper mats, publicity releases, envelope stuffers, radio and TV commercials—everything you need to tell your customers about the added convenience of booths of Alcoa® Aluminum.

FOR MORE INFORMATION ON ALCOA BOOTHS, write for brochure. And ask your jobber how Alcoa booths can increase your revenue and build customer goodwill. Aluminum Company of America, 1721-K Alcoa Building, Pittsburgh 19, Pa.

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

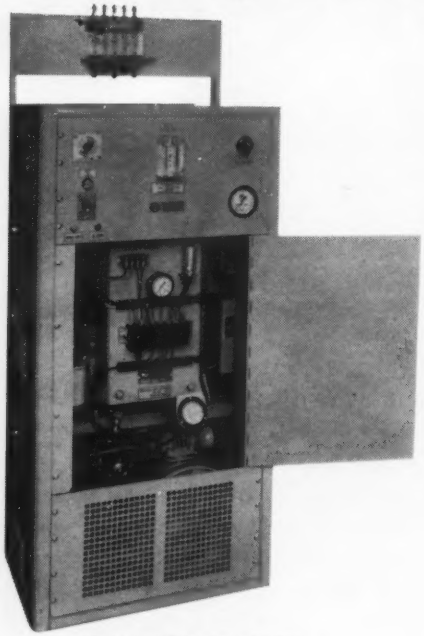
ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

YOUR GUIDE TO THE BEST IN ALUMINUM VALUE

NOW! from S&G MANUFACTURING CORP.

THE MODEL "RC" DEHYDRATOR AUTOMATIC

for pressurizing aerial and underground telephone cables



NEW MODEL "RC"
Cabinet Mounted

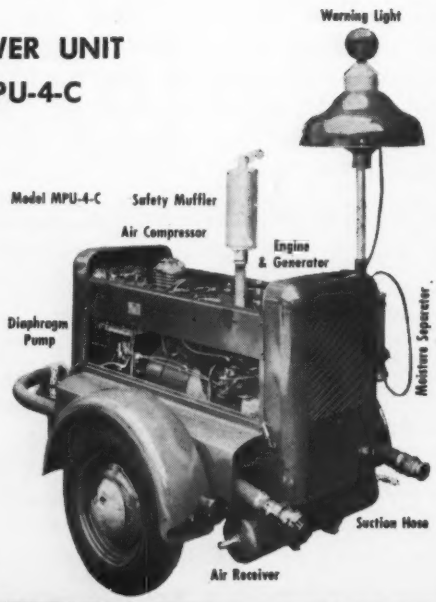
The Model "RC" Dehydrator is designed to supply dry air to telephone cables. Among its many outstanding safety features are:

- Hi-Lo pressure switch for alarm
- Humistat for alarm above 4% R.H.
- Power failure relays and separate fustat
- By-Pass Valve & alarm for excessive R.H.
- Mechanical control valve for stand-by air supply (O.P.N.) in event of power failure
- Additional safety features on air compressor
- Power supply is 115 volt, AC on the Dehydrator and Air Compressor
- Power consumption — 2 AMPS

The Model "RC" and "R" Dehydrators Automatic are designed for small installations of 80 miles or less of cable. The Model "RC" is a floor mounted unit, and the Model "R" is for wall mounting. Operating voltage is 115/220 volts, 1 phase, 60 cycle, and the output is 700 standard cubic feet per day maximum, with a dewpoint of —40°F. and power consumption of 2 AMPS.

MOBILE POWER UNIT
Model MPU-4-C

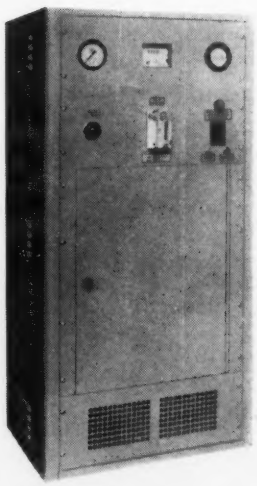
- Generator (slow speed for quietness) 2500 Watt, 110- Volt DC
- Pump — 2800 GPH Diaphragm to remove seepage and drain back
- Air Compressor — to put cables under pressure for cutovers or repairs
- Furnished with or without pump and compressor



MODEL "A"
Air Compressor Dehydrator

Exchange unit equipment designed to supply chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 60 cables. It is equipped with volume recording air meter, high and low pressure alarm switches, humidstat and hour meter.

- Completely automatic in operation
- Air purifier to eliminate oil mist
- Incorporates the latest safety devices



phone or write

S & G MANUFACTURING CORPORATION
P. O. Box 1309 • New Orleans 10, La. • JAckson 5-3142

AE-Lenkurt

HAS **EVERYTHING** YOU NEED FOR PROFITABLE CIRCUIT GROWTH

LENKURT SUPERVISION & CONTROL EQUIPMENT, for instance...

With Lenkurt Supervision & Control Equipment, you can open the door to highly profitable leased-line and extra toll business – *now*.

More and more business and industrial concerns are looking to telemetering and remote control to cut costs and increase efficiency. Lenkurt offers several types of equipment to do this job. For example, there's Type 51B.

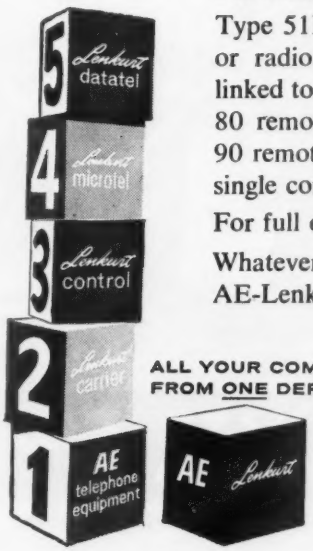
Type 51B is designed to operate over the wire or radio facilities which it supervises. When linked to any wire line or carrier channel, up to 80 remote indications can be supervised, and 90 remote operations can be controlled from a single control center.

For full details ask for Circular 51B-P4.

Whatever *your* expansion plans may include, AE-Lenkurt has what you need–plus the talent to handle the entire project from start to finish.

AE-Lenkurt services are flexible, and backed by experienced *telephone* engineers who are fully acquainted with the capabilities of your present equipment. They'll evaluate your requirements, then recommend the type of equipment that will meet circuit conditions most efficiently and economically over the years. Or, if you wish, they'll provide you with *complete* planning, engineering and installation service that relieves you of all short-range and long-range circuit expansion details.

For more facts on progressive planning for growth, call your Automatic Electric representative, or write T. B. Collins, Director, Carrier & Radio Sales, Automatic Electric Sales Corporation, Northlake, Illinois.



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Subsidiary of

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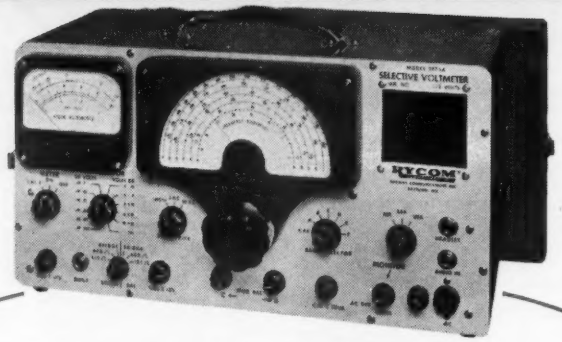
FREQUENCY SELECTIVE VOLTMETER

WAVE ANALYZER

Offers fast accurate amplitude measurements throughout the frequency spectrum of 300 cycles to 400 Kc



Model 2174

This instrument utilizes the heterodyne principle with balanced modulation and highly selective crystal filters which achieve the high resolution needed for accurate amplitude measurements of Carrier and Microwave Sub Carrier channels.

Direct reading in DBM for 135 and 600 ohm circuits or bridging.

SPECIFICATIONS
Model 2174 and 2174-A

Frequency Range: 300 cycles to 400 Kc. Level:—72 dbm to + 32 dbm (full scale) at 600 OHMS Accuracy: ± .5db from —80 to +32 dbm; 1 to 400 Kc. Selectivity: 6db down 80 cycles off: 60 db down 480 cycles off. Wider crystal filter and demodulator for monitoring SSB, AM, and FM—internal speaker and headset jack. Spurious Response: Below 60db. Low intermodulation: Below 60 db. Power Requirements: 115V, 50/60 cycles—48 Watts. Weight, 28 lbs.

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TAYLOR-COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

REX

MULTI-PAIR

Distribution Wire

Catalog No.	Guaranteed Pairs	AWG	Messenger Size	Minimum Breaking Strength (lbs.)
RDW-0119-U18	1	19	.109″	1800
RDW-0219-U18	2*	19	.109″	1800
RDW-0319-U18	3	19	.109″	1800
RDW-0419-U18	4*	19	.109″	1800
RDW-0519-U18	5	19	.109″	1800
RDW-0619-U18	6*	19	.109″	1800
RDW-1119-U18	11	19	.109″	1800
RDW-1219-U20	12	19	.120″	2200
RDW-1219-U28	12*	19	.134″	2680
RDW-1619-U18	16	19	.109″	1800
RDW-1619-U20	16	19	.120″	2200
RDW-1619-U28	16	19	.134″	2680
RDW-0322-U18	3	22	.109″	1800
RDW-0622-U18	6	22	.109″	1800
RDW-1122-U18	11	22	.109″	1800
RDW-1222-U18	12*	22	.109″	1800
RDW-1222-U20	12	22	.120″	2200
RDW-1622-U18	16	22	.109″	1800
RDW-1622-U20	16	22	.120″	2200
RDW-1822-U18	18	22	.109″	1800
RDW-1822-U28	18*	22	.134″	2680

Nominal Reel Length 4,000′

**Accepted by REA per Specification PE-15.*

THE *REX* CORPORATION

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Only Exide gives you so broad a "choice"

Orange County Telephone Co., of Middletown, N.Y., chose Exide-Manchex Batteries, unmatched for long life, for its Bloomingburg exchange. Unique positive plate lead buttons fit tightly into heavy Silvium alloy grid. Silvium is Exide's patented grid alloy, proved up to 100% more corrosion resistant. Available only in Exide batteries. Each positive plate button contains a reserve supply of lead that turns gradually to active material as needed.

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For complete information on Exide stationary batteries, write for the new illustrated brochure. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 20, Pa.

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SPECIALISTS in INSULATED TELEPHONE WIRE

Where specialization means:

- **the most modern production facilities and machines in the industry!**
- **the only *complete* product testing program in the industry, from raw materials to finished wires!**
- **the most advanced research and development laboratories in the industry!**
- **the most extensive, truly complete line of insulated telephone wires!**
- **constant development of new wires to meet the expanding needs of America's growing independent telephone companies!**

Only Alphaduct devotes all its effort to making the best in insulated wires for the Independent Telephone Industry, from developing superior wire constructions to introducing better packaging and shipping methods. Alphaduct's modern and up-to-date equipment for manufacturing room-temperature rubber in itself gives great quality assurance to its users. Among the developments pioneered by Alphaduct are *dated drop wires... carton packaging... SPIRACODE color coding*, the most positive color coding method available.

RUBBER INSULATED TELEPHONE WIRES

Dated Drop Wire
Bridle Wire
Outside Distributing Wire (Aerial)
Underground Service Wire (Direct Burial)
Tree Wire
Underground Distribution and Service Wire (Direct Burial)

THERMOPLASTIC INSULATED TELEPHONE WIRES

Alpha "C" One Pair Parallel Distribution Wire (Aerial)
Distributing Frame (Jumper) Wire
Ground Wires
Inside-Outside Station Wire
Inside Station Wire
Underground Distribution and Service Wire (Direct Burial)
Underground (B) Service Wire (Direct Buried Drop Wire)

All of the above wires are obtainable in the styles, types and sizes recognized throughout the Independent Telephone Industry. Stocks are available in our distributors' warehouses. R.E.A. approved constructions are also available.

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Extra service is a Graybar trademark, too

Like you, Graybar often is called upon for a little extra service. We wouldn't have it otherwise. For Graybar grew up with the telephone industry.

Perhaps your extra need is a technical one. Graybar is ready with competent assistance—inside, outside.

You may face a problem in the rising cost of maintenance. Consult Graybar for the quality equipment that helps provide the answer.

Or you may simply want quicker delivery. In any event, at any time, you can count on Graybar for an extra measure of service. 911

Graybar is your number one source for service... technical assistance...quality equipment...prompt delivery.

GraybaR

ELECTRIC COMPANY, INC.

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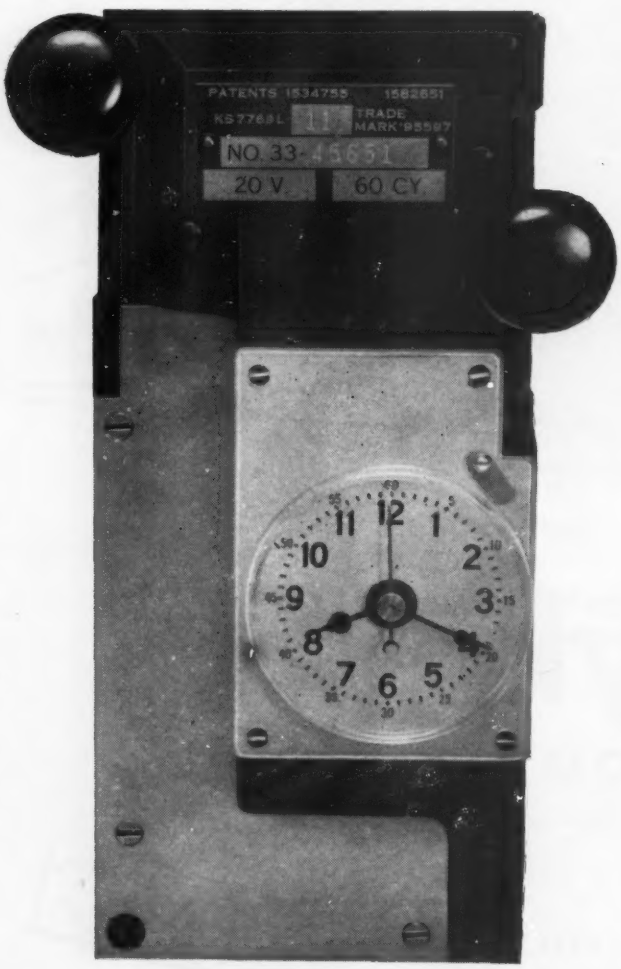
Everything Electrical GraybaR ELECTRIC COMPANY

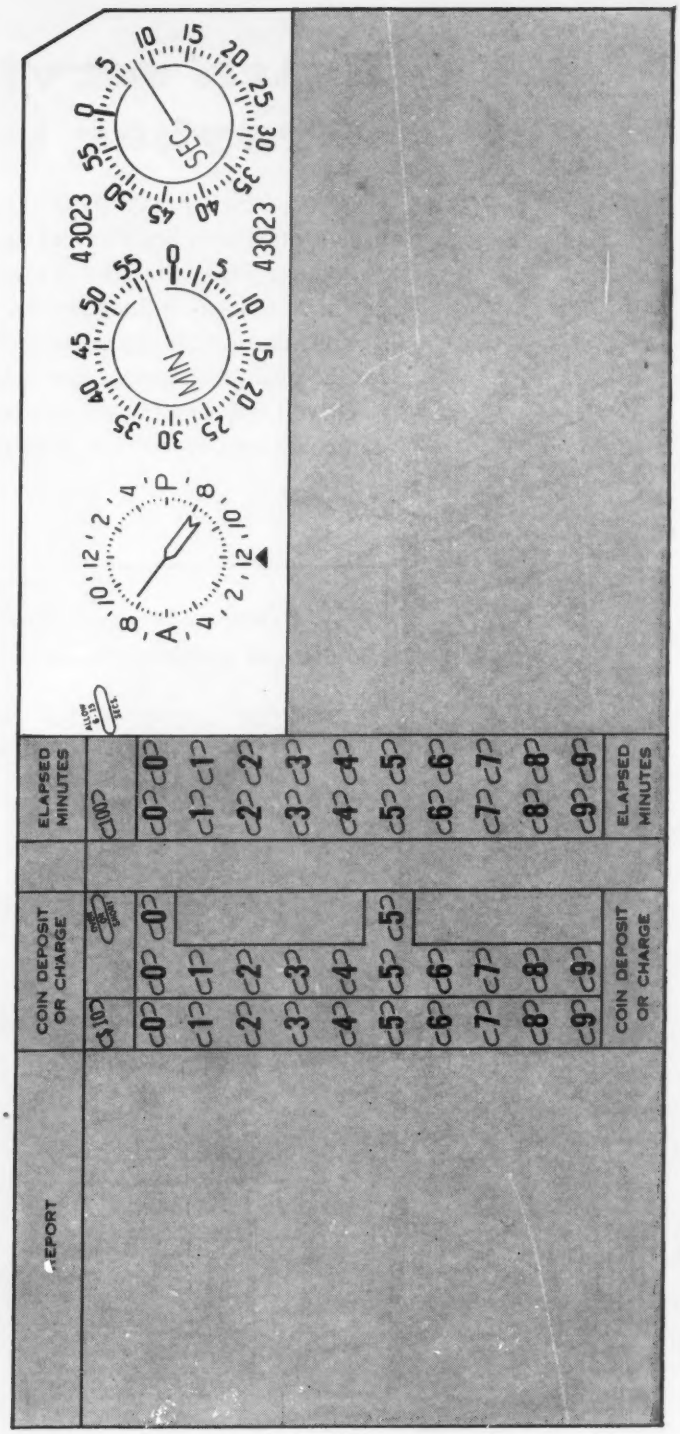
CALCULAGRAPH IS READY FOR MARK SENSING NOW!

If you are planning to use mark sense toll tickets now (or later) be sure your Calculagraphs are readily adaptable. Remember to do these three things now —

1. When ordering new Calculagraphs specify "set back" handles—this feature clears the way for mark sense toll tickets (or ANY SIZE ticket in fact).
2. Plan a program of modification of Calculagraphs now on your switchboard.
3. If you are still using the old round-type Calculagraphs, consider the economics of replacing them with the new space-saving Model 33 that will include all the latest improvements—set back handle, color-coded handles for easier operation and 60-minute dial to assure 100% accuracy on all calls.

If your analysis shows that mark sensing makes sense economically, or your present system requires a larger size ticket, consult your Calculagraph distributor today. Ask him about the set back handle feature as well as other modernization features of the NEW Calculagraph.





CALCULAGRAPH Company

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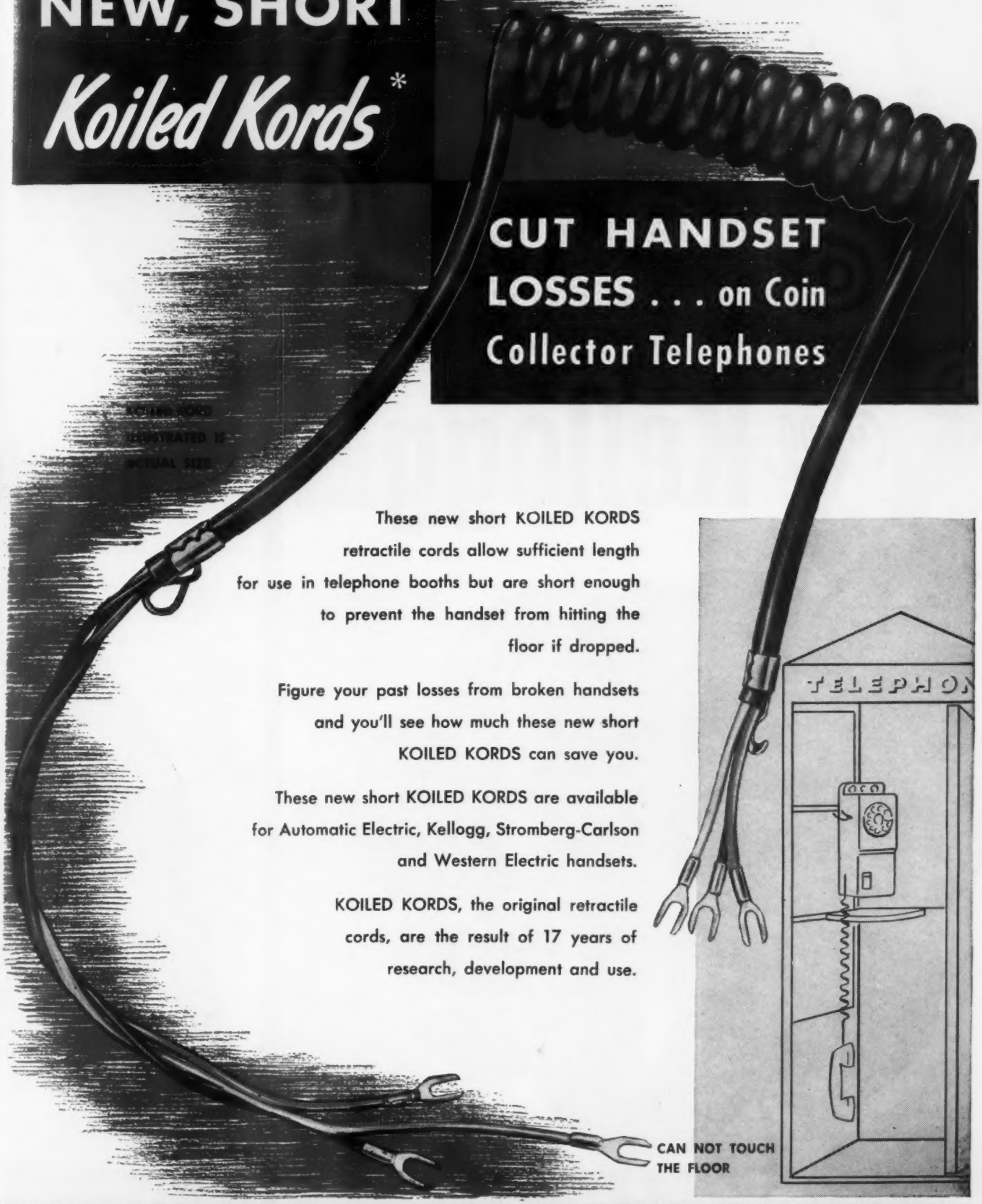
Telephone: HUmboldt 2-0213

Manufacturers of Elapsed Time Recorders for over 65 years

NEW, SHORT *Koiled Kords**

CUT HANDSET LOSSES . . . on Coin Collector Telephones



These new short KOILED KORDS retractile cords allow sufficient length for use in telephone booths but are short enough to prevent the handset from hitting the floor if dropped.

Figure your past losses from broken handsets and you'll see how much these new short KOILED KORDS can save you.

These new short KOILED KORDS are available for Automatic Electric, Kellogg, Stromberg-Carlson and Western Electric handsets.

KOILED KORDS, the original retractile cords, are the result of 17 years of research, development and use.

CAN NOT TOUCH THE FLOOR

*KOILED KORDS is a trade mark of KOILED KORDS, INC.

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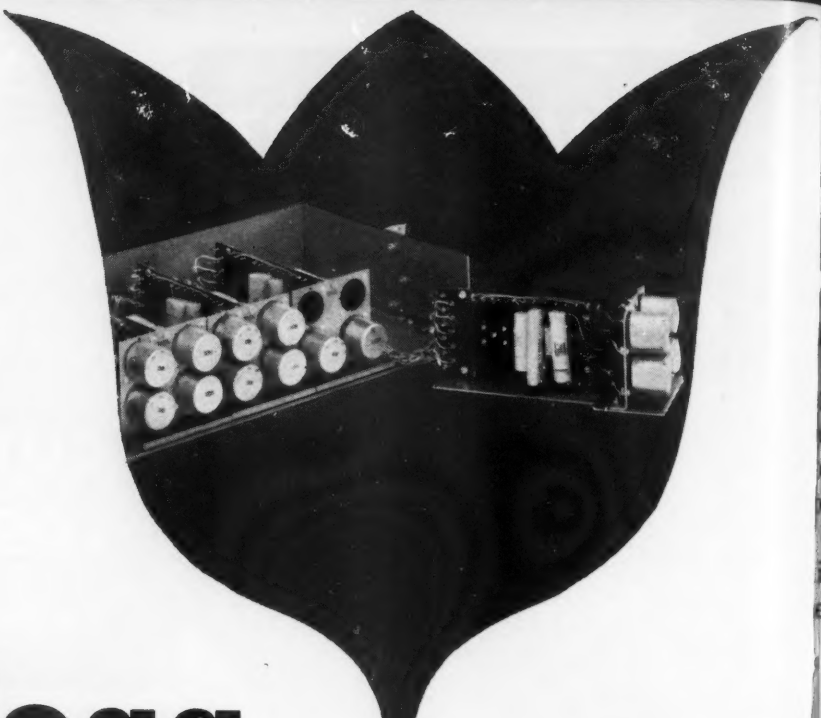

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VOLUNTEER FIRE CALL

Operates over existing lines. Up to 10 men may be alerted with a single call. Acclaimed as the best way to "get the men on the scene faster." Ideal for small communities after conversion to dial.

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Miniaturized! Saves 75% in spac Meets all requirements of high grade toll circuits. Provides fine coarse attenuation adjustments.. nearly constant impedance acros voice frequency band... unaffecte voice circuit balance when signal trunk circuits are operated.

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ellogg-designed products like these will help make your present uipment go farther... streamline your operations... permit you to er better and more varied service to your subscribers... and wind the year with more profit!

Serving independent telephony for more than 60 years, knowing ur operational needs, and backed by the world-wide research facili-es and experience of International Telephone and Telegraph Cor-ration, Kellogg continually searches for ways and means to help u offer better service, increase your profits.

Whatever your requirements: basic equipment, famous brand sup-ies, profit-producing specialties, experienced counsel... call your ellogg representative. Let him show you what Kellogg can do.

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LOUD RINGING BELL

Commands attention anywhere! Ideal for noisy locations: factories, depots, school yards, construction sites, etc. Compatible with all circuits... weatherproof... simple to install.

TRANSISTOR RINGING GENERATOR

Trouble-free transistors mean minimum maintenance. All components are plug-in, no moving parts or contacts to adjust or clean. Serves any size office. Choice of any combination of five or less frequencies; each separately mounted.

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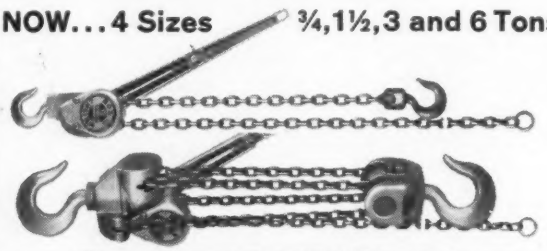
YOU'LL LIKE LINDSAY

THE LINDSAY TELEPHONE SUPPLY CO., *Est. 1939*
360 East Highland Rd., Northfield, Ohio
Telephone: IMperial 7-7181

New ¾-ton Type "C" Pull-A-Way

NOW . . . 4 Sizes ¾, 1½, 3 and 6 Tons



WRIGHT Type "C" Pull-A-Ways make easy work of hundreds of quick hook-up jobs. Now available in four sizes—¾, 1½, 3 and 6 ton—Type "C" Pull-A-Ways are portable, safe and rugged. Corrosion-resistant modern aluminum alloy castings are used for gear case, handle and covers of all models. Hooks, load chain and chain sheave are made of alloy steel. Positive, dependable load brake securely holds load at any point. Lubricated for life. Weights: ¾-ton, 14 lbs; 1½-ton, 23½ lbs; 3-ton, 36½ lbs; 6-ton, 63 lbs.

Write **to our York, Pa., office for Bulletin DH-56A**

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Wright Hoist Division • American Chain & Cable Company, Inc. ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

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Printed by

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350 East Twenty-second Street, Chicago 16

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BY GENERAL INSULATED WIRE WORKS, INC.*

*Licensed to manufacture under existing patents.

Telephone cord sets of proved performance backed by General Insulated's unmatched experience and know-how in the manufacture of quality telephone tinsel cordage:

Spiraflex **HANDSET CORDS** in bright colors with non-staining thermoplastic jackets in solid color extrusions matching color shade and sheen of telephone sets. Also non-staining black Neoprene jacketed cords. Both types available with or without integral moldings and terminations. Furnished in standard or extra long lengths.

STRAIGHT HANDSET AND DESK SET CORDS are available in non-staining thermoplastic constructions in matching colors and in black Neoprene.

GENERAL INSULATED WIRE WORKS, INC.

A DIVISION OF GENERAL CABLE CORPORATION
Providence 5, Rhode Island

... of course ANSONIA Ankoseal makes

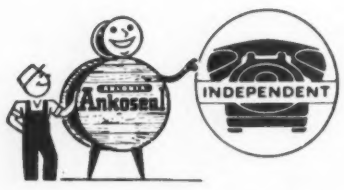
ALPETH* CABLES

... prompt delivery too!

- Low Shield Resistance
- All Pairs Guaranteed
- Fully Color Coded

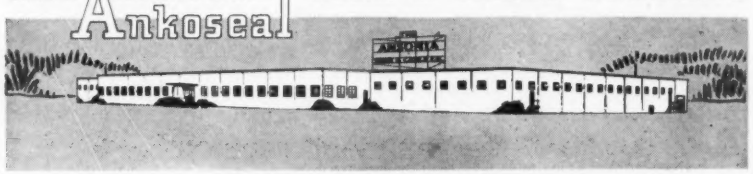
You can depend on Ansonia Ankoseal for Alpeth Cables made under rigid quality controls.

Ansonia Ankoseal Alpeth Cable is made in conformance with the latest REA specifications.



Ask for Ansonia Ankoseal Telephone Cable Literature

THE ANSONIA WIRE & CABLE COMPANY



111 MARTIN STREET, ASHTON 3, RHODE ISLAND

"Leadership In Plastic Cables Through Quality and Service"

*MANUFACTURED UNDER LICENSE AGREEMENT WITH WESTERN ELECTRIC COMPANY, INC.

282-9

Telephone and Power Companies
CUT BRUSH DISPOSAL COSTS 25 TO 50%
with FITCHBURG CHIPPERS

Crewmen from Rockland Light and Power Company, now Orange & Rockland Utilities, Nyack, N. Y. use special aerial ladders for pruning topmost branches.

BRUSH DISPOSAL METHOD No. 1
Rockland Light and Power Company crewman blows chips from FITCHBURG CHIPPER along roadway.

BRUSH DISPOSAL METHOD No. 2
Rockland Light and Power Company crewman blows chips from FITCHBURG CHIPPER into truck bin.

Some of the many Telephone and Power Companies using Fitchburg Chippers

Arizona Public Service
Phoenix, Arizona
Atlantic City Electric Company
Atlantic City, New Jersey
Central Hudson Gas and Electric Co.
Newburgh, New York
Consumers Power Co.
Jackson, Michigan
McDaniel Telephone Company
Salkum, Washington
Millington Telephone Co.
Millington, Tennessee
Mt. Vernon Telephone Corp.
Mt. Vernon, Ohio
Missouri Power & Light Co.
Hermann, Missouri
New Jersey Bell Telephone Co.
Vineland, New Jersey
Ohio Central Telephone Corp.
Patuskala, Ohio
Pacific Telephone and Telegraph
Northwest Area
Portland General Electric
Portland, Oregon
Public Service Co. of Oklahoma
Lawton, Oklahoma
Shawnigan Water and Power Co.
Quebec, Canada
Somerset Telephone Co.
North Anson, Maine
Southern California Edison Co.
Los Angeles, California
Valley Telephone Company
Silverton, Oregon
West Jersey Telephone Co.
Belvidere, New Jersey

A FITCHBURG CHIPPER will help get your brush disposal job done with *fewer men at less cost*—in any weather, wet or dry. No more loading, hauling, dumping, burning. Chips may be automatically loaded on truck or blown along right-of-way to keep down weeds.

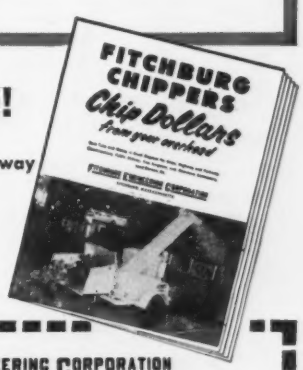
SAFETY IN OPERATION: Exclusive Fitchburg spring-activated feed plate automatically adjusts as wood of different sizes is fed into the machine. This feature allows you to chip larger size wood without extra power. It reduces shock action, protects the operator in case foreign materials are accidentally fed during operation.

MINIMUM MAINTENANCE: No heavy fly wheel to cause clutch strain or bearing failure. Easily maintained by your own field personnel.

ONE YEAR GUARANTEE: Only Fitchburg Chippers give you *all* these features, backed by the experience and engineering skill of the world's pioneer manufacturer of wood chipping equipment. For a facsimile of the exclusive Fitchburg guarantee and color brochure described at right, mail the coupon today.

NEW! FREE!

Mail Coupon for Brochure. Shows cut-away drawings of Fitchburg Chippers in action, specifications, photographs.



FITCHBURG ENGINEERING CORPORATION
Fitchburg, Mass., Dept. TEM-109
Send Free Copy of "Chip Dollars from Your Overhead."

Name .....
Position .....
Company .....
City or Town ..... State .....

FITCHBURG ENGINEERING CORPORATION FITCHBURG, MASS.

RAYTHEON's 200-AMP BATTERY CHARGER is just one of the new Rectichargers introduced at the 1959 U. S. I. T. A. convention in Chicago. If you did not pick up the facts at the show, you can get them by writing Raytheon, Manchester, N. H.

POWER SUPPLIES FO

PBX · PABX · MANUAL · STEP-BY-STEP · X-BA AUTO

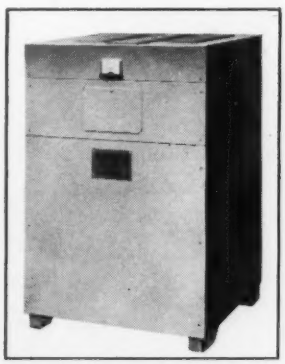
n.....in the power field with new equipment

CHICAGO, 1959—Raytheon answers the power supply needs of a rapidly growing telephone industry by expanding its 50- and 130-volt battery charger lines.

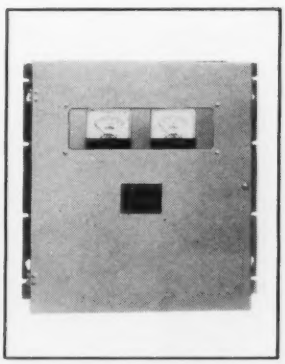
This new power equipment utilizes Raytheon-developed and thoroughly tested silicon-rectifier circuitry that offers greater reliability with less maintenance.

These new, highly efficient Rectichargers are up to 50% smaller than comparable selenium models — saving valuable floor and rack space.

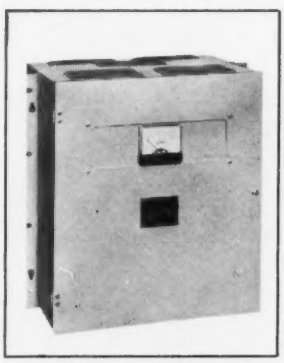
For literature on these new units or for help with any of your battery charger or battery eliminator requirements, simply write Raytheon Company, Manchester, New Hampshire.



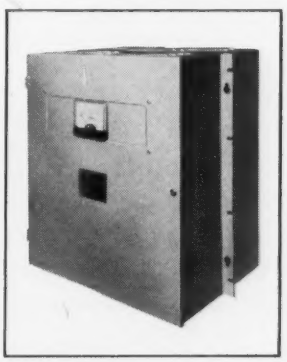
RC-50K200: 200-ampere, silicon battery charger is added to Raytheon's 50-volt Recticharger line. This unit is 46 inches high by 30 inches wide by 29 inches deep—less than half the size of its selenium counterpart.



RC-140A3: This new 3-ampere, 66-cell charger was designed for 130-140 volt power-board applications. Companion 6- and 12-ampere units, silicon CEMF cells and control panels give Raytheon a complete power panel line.



RC-50A9: This new 9-ampere rating provides reserve capacity for growing exchanges. RC-50A9 adapts to 19, 23 or 30-inch mounting and occupies only 15 inches of vertical rack space.



RC-50A18: Another intermediate charger rating to meet a recognized power requirement for large PBX's and medium-sized CDO's. This 18-ampere silicon charger is only 20 inches high.

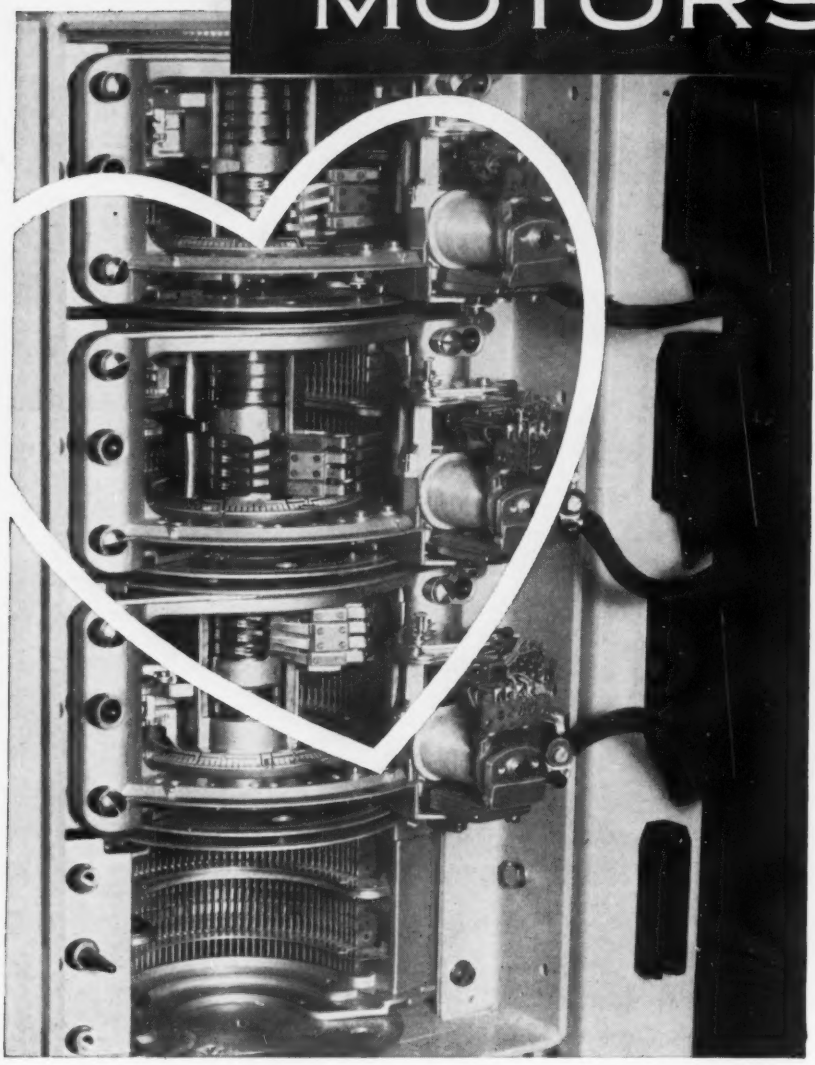
RAYTHEON COMPANY
Industrial Apparatus Division

RAYTHEON *Excellence in Electronics*

ES FOR THE TELEPHONE INDUSTRY

X-BA AUTOMATIC TOLL-TICKETING · ELECTRONIC SWITCHING · CARRIER · MICROWAVE

MOTORSWITCH



by USI

Heart of the
Central Office
Telephone Exchange

The Motorswitch has been proven in over a million lines of central office systems now in world-wide service . . . overwhelming evidence of its universal acceptance. Use of the USI Motorswitch enables central office systems to combine the speed and flexibility of common control systems with the simplicity of step-by-step systems.

HIGH STEPPING SPEED—Searches over a maximum of 360 contacts per second, compared to 30 to 40 on stepping switches.

NEGLIGIBLE VIBRATION—Is an advantageous result of the Motorswitch being electrically driven and electrically stopped. Microphonics are reduced and noise levels in equipment rooms are lowered by the absence of ratchet-driven parts.

PRECIOUS-METAL TWIN WIPER CONTACTS—In talking circuits provide lowest contact resistance and maximum reliability and are used throughout the Motorswitch construction.

SOLDERLESS BANK CONTACT STRIPS—Reduce the required number of soldered connections by 90% . . . increase reliability . . . simplify regrading . . . cut the need for grading and level hunting switches.

VERTICAL BANK CONTACTS—Shrug off wear-producing dust.

USI® CORP.

UNITED STATES INSTRUMENT CORPORATION

CHARLOTTESVILLE, VIRGINIA

HERE'S HOW ANACONDA DIRECT BURIAL WIRE & CABLE MAY SAVE YOU MONEY

New advances in insulation and jacket materials, termination equipment and plowing techniques now, make Direct Burial Wire and Cable Systems more economical in many areas.

Telephone wire and cable plants are now being buried directly in the earth.

That's where Samuel Morse attempted to place the first commercial line in 1843. He designed a direct burial, fully color-coded cable for America's first telegraph line between Washington and Baltimore, but his insulation proved defective and Morse was forced to take the conductors out of the cable, separate them and string them on poles with crossarms.

Now, the four freedoms of buried plants – (1) freedom from storm damage, (2) freedom from tree clearing and retrimming expenses, (3) freedom from the safety hazards associated with power contacts and pole climbing, and (4) freedom from right-of-way procurement difficulties – can be yours at actual savings in cost.

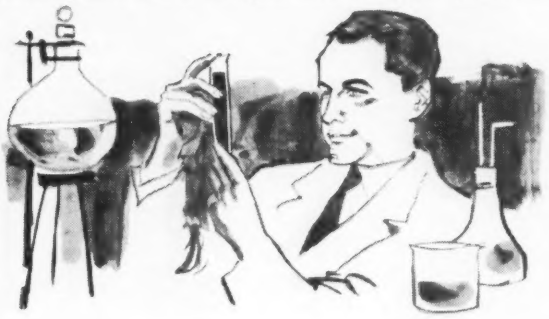
Anaconda's high-molecular weight polyethylene insulation – tough and resistant to many direct burial hazards – is part of the reason. The use of this rugged, crack-resistant material, together with new terminals and new plowing developments, have overcome most of the problems that formerly stood in the way of economical direct burial applications. Now in selected areas, a direct burial system may cost you less – in initial installation and in maintenance – than an aerial plant!

On the following pages, you will find pertinent questions and answers that show why and how Anaconda direct burial wire and cable may make possible important savings. Read these pages. Then give careful consideration to direct burial wire and cable for *your* telephone system.

THESE DIRECT ANSWERS TO DIRECT BURIAL QUESTIONS PROVE HOW ANACONDA CABLES COST LESS TO INSTALL...LESS TO MAINTAIN!

GENERAL

Q. What developments in recent years have made buried-plant costs comparable to aerial plant?



A. First, the increased availability of polyethylene at lowered cost. The use of polyethylene as insulation and jacket, thereby taking advantage of its excellent electrical and physical properties, results in a corrosion- and moisture-resistant cable nearly ideal for direct burial purposes. Second, properly designed diesel-powered plowing equipment, reduces labor and other associated costs of burying cable.

While aerial plant costs have tended to increase, the costs of buried plant have been reduced to a level where, in many cases, they are equal to or less than aerial plant.

Q. What are limiting factors to buried-plant installations?

A. Buried-plant placement costs are materially effected by terrain; rocky or built-up areas or paved streets and sidewalks can make economical plowing impracticable to the extent where even the lower-than-aerial maintenance costs are insufficient compensation. Planning ahead, such as with a suburban-housing builder, can often result in an economical buried plant at a saving over aerial plant. So much of suburban and rural areas are quite suitable for modern planning operations that the future of buried plant is extremely optimistic.

TRANSMISSION

Q. Are there any transmission problems peculiar to buried plant?

A. No. There is no difference between open wire and cable circuits whether the cable is aerial or buried.

APPLICATION

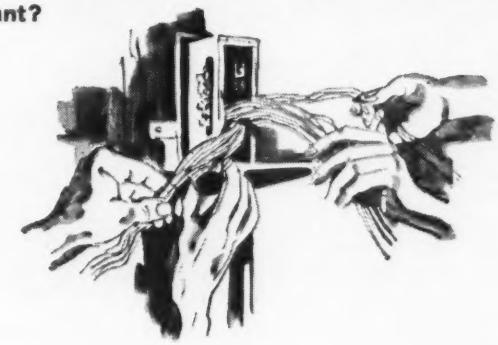
Q. Splicing has always been troublesome. Has this problem been licked with the new products?

A. Yes. Pedestal-mounted housings, which are available from a number of manufacturers, have been designed for this purpose. The buried cables or wires are brought into the weatherproof housings and terminated on terminal strips. This system not only removes a possible source of trouble resulting from buried splices, but provides convenient facilities for efficient installation, testing, and maintenance.

Q. How are customer services connected to buried plant?

A. Special terminals mounted on pedestals are now available for buried plant. The buried wire or cables are brought into the terminal housing and the proper pairs terminated. Service drops, aerial or buried, are connected to the terminal strips just as to aerial cable terminals.

Q. What about electrical protection of buried plant?



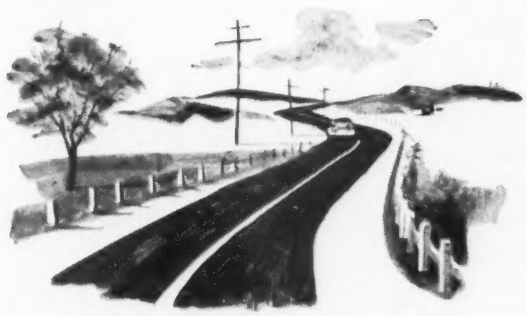
A. The built-in high-dielectric strength of buried cable and wire minimizes the need for special protection (see construction details, page 4). The shields of the wire or cable should be grounded to all pedestals and, wherever it is convenient, connected to good electrical grounds. When long runs of open aerial plant are connected to buried cable, suitable protector blocks should be used.

PLOWING TECHNIQUES

Q. What type of plowing equipment is generally used with the buried wire and cable described?

A. The most desirable plow is one that makes a slot by compressing the earth just wide enough for placing the cable. The cable is fed down through the plow blade, which is maintained at the proper depth, in a smooth tube having a means of bending the cable without damage, and is placed in the bottom of the slot. Since the cable has been plowed with minimum disturbance to the surface, backfilling is not required.

Q. Is the plowing done on private or public rights-of-way?



A. The cost of the private rights-of-way, fences, farm crops, etc., generally makes it too costly to plow main cable runs along private rights-of-way. The best location is along highway rights-of-way. In some cases, the highway shoulders are used. In others, the extreme edges of the highway right-of-way is preferred. In all cases, the highway officials having jurisdiction should be consulted and a permit obtained. Experience has shown that if the highway engineers are properly informed as to the type of plowing involved and the minor disturbance to the highway surface, they will grant a permit since buried plant eliminates a pole line and the necessity of extensive tree clearing along the highway.

Q. What plowing depths are usually used?

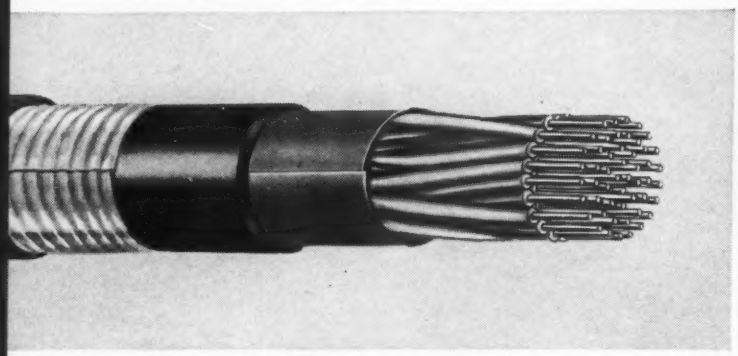
A. Normal depths of 24 inches for cable and 18 inches for buried wire have been found satisfactory in most areas. Where rocks, ditches, or other obstacles are encountered, the depths will need to be modified.

MORE INFORMATION ON FOLLOWING PAGE ⟶

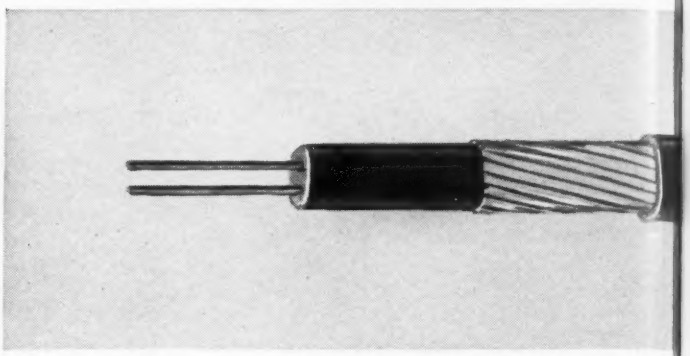
THE INSIDE FACTS ON

THE CONSTRUCTION OF ANACONDA DIRECT BURIAL TELEPHONE WIRE AND CABLE

See for yourself why Anaconda Direct Burial Telephone Cable resists underground hazards . . . gives long life and dependable service



TYPE PCP AND PCPG



TYPE BW

DIRECT BURIAL CABLE:

Cable Core: Conductors insulated with high-molecular weight color-coded polyethylene provide excellent electrical properties with great mechanical toughness and crushing resistance.

Inner Jacket: This inner jacket consists of high-dielectric strength polyethylene. It provides a second line of defense against moisture penetration in the event that the outer jacket is damaged. It also provides a high-dielectric strength barrier against lightning impulse breakdowns between the pairs and the shield.

Shield: The PCP type has 5 mils of longitudinally applied *copper* tape, rather than aluminum tape used in aerial cable. The copper provides a corrosion-resistant, low-resistance shield. This shield, coupled with the high-dielectric strength of the inner jacket, makes the over-all cable highly resistant to lightning damage. The copper shield also provides mechanical protection against the attacks of termites and rodents.

In areas where gophers are known to exist, additional protection against attacks by these rodents has been found necessary. For this purpose, the copper shield thickness has been increased from 5 mils to 10 mils and cables with this shield thickness are designated PCPG.

Outer Jacket: High-molecular weight polyethylene, highly resistant to abrasion, weathering, moisture, fungus, corrosion and environmental cracking.

DIRECT BURIAL WIRE:

Insulation: Conductors insulated in parallel with black high-molecular weight polyethylene. The insulated core has a rounded oval shape to facilitate tight fit of the steel armor wires – thus minimizing capacitance unbalance to ground.

Shield: A helical serving of closely spaced flat steel wires for mechanical protection against attacks of termites and rodents. The shield wires are flooded with an asphaltic base compound to resist corrosion. The shield, coupled with the very high-dielectric strength of the core, provides excellent resistance to lightning damage. The helical method of application of the shield wires also results in their contributing substantially to the tensile strength of the wire (over 400 pounds) which is needed to withstand stresses in installation and operation.

Outer Jacket: A tough, flexible thermoplastic jacket provides added mechanical protection for ease of installation and longevity of operation.

59222

PHONE THE MAN FROM

ANACONDA®

FOR TELEPHONE CABLE

the independent manufacturer for the independent telephone industry

USITA President-Elect FOSTER B. McHENRY, Jefferson City, Mo.

USITA 1st Vice President, C. C. PEARCE, Riceville, Ia.

Independent Telephony's Finest Hour

By HUGH A. BARNHART*
President,
U. S. Independent Telephone Association

IT IS WITH mixed feelings that I come before you this afternoon to deliver the President's customary "State of the Union" address. At the outset I want to thank you for the honor you bestowed upon me a year ago. I feel it is a real distinction to have served as president of an Association like ours. I am sure my predecessors must have felt the same way, and, frankly, it is with some degree of reluctance that day after tomorrow I will relinquish my post to my able successor. But on the other hand I don't resent stepping down too much. In fact it's like growing old — something I don't resent — as many are denied that privilege.

My talk with you today will, in general, be in the nature of an informal account of my stewardship. I have left to other and better qualified hands detailed reporting on specific events of the past year involving your Association's affairs. They are all contained in Mr. Bailey's annual report, printed copies of which are available for distribution at the registration desk. In it you will find that Clyde, with his customary industry and thoroughness, has written an exhaustive and comprehensive summary of events, including legislative developments and other important matters. I commend the document to you for a careful and thorough reading.

It was after studying this accounting of what has transpired in our industry, not only in the past year but during the past several years, and after I had given some thoughtful consideration to the opportunities that lie ahead that I chose as the theme of my discussion: "*Independent Telephony's Finest Hour.*" When you consider our record of achievements, especially during the past 10 or 12 years, when we consider the progress we have made, when we think of the growth we have had, when we consider our present status and our future prospects, and as we leave the Fabulous Fifties in a blaze of glory and start what someone has designated as the Sizzling Sixties, I truly believe we can regard this momentous time in history as our industry's finest hour.

It is with this challenging thought in mind that I would like to talk with you today, chiefly about the prospects for continued growth, progress and prosperity in our branch of the industry. I want to refer only briefly to our record of accomplishments, especially since the end of World War II, and I would like to invite your attention to the "unbounded horizon" or "the unlimited ceiling," as they say in aviation, which surely will be ours if we use the means now within our hands to see that these promising prospects are achieved. One of the most valuable and important instruments for such suc-

**Adapted from a paper presented by Mr. Barnhart at the 1959 USITA Convention.*

cess, as I see it, is the continued organized dynamic effort of our national Association, the U.S.I.T.A.

Here I would like to review very briefly just a few of the more important matters that have claimed our attention this past year, some of which will require our continuing efforts in 1960 and perhaps for years after that.

Communications Excise Taxes

FIRST, there was the battle we all jointly waged — and I would say with good result, everything considered — against the excise tax on communications services. Someone has said that death and taxes may always be with us, but death, at least doesn't get any worse. Telephone excise taxes haven't been getting any worse, but neither have they been getting any better until this year. In 1959, however, we were able to make a slight dent in the armor of the taxeaters and spenders on Capitol Hill. . . .

To win the war we must devote our time from now until the next Congress convenes by flooding our subscribers, who after all are the voters, with information about this inequitable tax which they are paying. Tell them that during 1959 the telephone subscribers of this nation will pay a total of $700,000,000 dollars in telephone excise taxes. Let them know time and again that if this tax were removed it would reduce their monthly telephone bills by 10 percent. Congressmen listen to the folks from back home. And then when the day comes that tax reduction is given serious consideration by Congress the telephone excise tax will be the first to come off.

Switchboard Operator Exemption

IT IS A matter of common knowledge, I think, that had it not been for the persistent and continual efforts of our Association our switchboard operator exemption under the minimum wage and hour law would have been scuttled long ago. I am glad to be able to report to you that legislation which would have diluted and made ineffectual our exemption was not passed by the 86th Congress. However, there is every indication that next year even more vigorous efforts by the powers arrayed against us will be made to increase the minimum wage and to abolish the switchboard operator exemption.

I have said this at every state association convention and I want to repeat it here. If your company should be hurt by this new wage and hour law you had better get ready for it right now — because sooner or later the axe is going to fall. Your best move is to convert to dial at the earliest possible moment. If you are just keeping your head above water then we advise you to look around and merge with neighboring independents and come up with a financially sound corporation that will show a profit. During the last several years new sources of financing have been opening up and they will help you in building a complete modern plant. When you give good service your station growth will start.

I disagree with those predicting that within the coming years our small Independent companies will fade out of existence. We have hundreds of family-owned or locally owned companies which through sound financing have modernized and with from 800 to 1,500 stations are operating well in the black. They are giving good service and their owners are happy living in their small communities and with good incomes. I want to give encouragement to all small companies to keep working and to modernize. Then you will grow along with the nation's economic expansion which is being felt everywhere.

Boost In Toll Compensation

I AM GLAD to report to this convention that as a result of the good work done by our Toll Compensation and Settlements Committee and its Subcommittees an agreement has been reached with the Bell System for an annual increase in toll compensation of approximately $12 million, based on estimated 1959 over-all toll traffic volumes, or about $8 to $9 million additional revenue annually to Independent companies settling on average cents-per-message schedules. This is with the understanding that the industry will proceed with a study of automatic toll ticketing and of the line haul situation.

Agreement has also been reached on revision in the settlement plans for private line services and for foreign exchange services which are expected to total somewhere between $500,000 and $750,000 annually in increased settlements to the Independents. This is in addition to the increase in settlements for interchanged message toll business.

The total sum going to Independents in 1958 for settlement on interchanged business was approximately $204 million. The total amount accruing to our companies during the coming year will be very substantially increased by the increase in toll messages and the revised schedules which I have mentioned.

It is appropriate to add that the amount which was asked in our negotiation conference with Bell System representatives was considerably more than that which I have indicated. On the other hand, what the Bell representatives first offered was materially less.

With the impact of inflation, of higher taxes, of higher wages and of higher operating expenses generally, there is a growing feeling, in which I concur, not only that the share of Independent companies in the total revenue on interchanged business should equitably be even larger, but also that the time lag in giving practical recognition to increased costs should be materially reduced. The last previous increase in settlement schedules was in 1956, three long years ago.

These circumstances point unavoidably to the need for keeping our Association geared up even better than we have so that the time lag may be reduced to an absolute minimum and the manifest inequities inherent in delay may be avoided. Attention is being given to this objective.

These toll compensation problems are complex and

vexatious ones. They require not only a vast amount of study and preparation but a wealth of technical knowledge relative to settlements on interchanged business. Our Toll Committees and Engineering Staff have worked long, hard and diligently and deserve the thanks and gratitude not only of the United States Independent Telephone Association but of all Independent companies. We are indebted also for the assistance and cooperation of the Bell System representatives in joint studies of these problems.

The two groups have been studying costs and conferring for almost a year. From personal observation I can report that they met numerous times to work out differences and to reach a final settlement that would be acceptable to all. In these sessions at the conference table both sides had their differences but they finished up with a willingness to get together for the good of the telephone industry. I believe they have done just that. The Bell and the Independent will both benefit as the toll business continues to grow.

Industry Advertising

BEING a newspaper publisher as well as a telephone man, I suppose it is only natural for me to believe in advertising. I have seen its good results for too long a time not to be an enthusiastic advocate of the use of this potent tool, advertising, which incorporates the power of suggestion and psychology of print. If rightly used I know it can be a great force for good for every telephone company and for the industry as a whole. That is why I have taken a special interest this past year in the activities of our Advertising Committee and its program for 1960. I recently attended a preview of that program. If it is approved by the directors, I predict it will be the most effective and widely read of all preceding campaigns.

Since we spend $200,000 yearly in national advertising, which incidentally is a mere drop in the bucket compared to the similar expenditures by General and Bell, I feel justified in talking to you at some length about it.

It is difficult, of course, in a broad program such as this always to trace direct benefits down to individual companies. Any institutional advertising program is essentially a seeding operation which takes time and perseverance to cultivate to the point of reaping the expected harvest of good will. But now that the seed has been planted and the cultivation has been in operation for some time, the cumulative effect is bound to mature as the effort goes on.

Another thing about an advertising program such as ours is the preventative nature of good will generated. There are many Independent telephone companies which now have or will have service problems, or other public relations problems, which will bless the day that this advertising program has prepared a more favorable soil of public relation in favor of Independent telephone company operations. Without it, without any knowledge or awareness of Independent company service perform-

McHenry Elected USITA President: Pioneers Name Berney Simner President

FOSTER B. McHENRY, president of the Capital City Telephone Co., Jefferson City, Mo., was elected president of the United States Independent Telephone Association as the organization, which represents the interests of 3,800 Independent (non-Bell) telephone companies serving more than half of the geographical service area of the United States, closed its four-day convention. Vice Presidents elected were: Clifford C. Pearce, Riceville, Ia.; Frank G. LaPrade, Martinsville, Va.; and Elnathan C. Gates, Minneapolis, Minn. Re-elected officers are: Clyde S. Bailey, executive vice president; George C. Richert, secretary and Courtney S. Snyder, assistant sec.

Featured speakers at the closing session were George Murphy, Vice President, Desilu Productions, Inc., Hollywood, Calif.; and Arthur "Red" Motley, President, Parade Publications, Inc., New York.

Newly elected Directors of the Association are: W. A. Kern, Rochester, N. Y.; Dail H. Holderness, Tarboro, N. C.; Harold C. Ebaugh, Havre, Mont.; C. D. Ehinger, Decatur, Ind.; and Allen Stacey, Sunland, Calif.

Directors re-elected were: Leonard D. Densmore, Lincoln, Neb.; Clive W. Haas, Big Timber, Mont.; Merle M. Hale, Lincoln, Neb.; Frank G. LaPrade, Martinsville, Va.; R. A. Lumpkin, Mattoon, Ill.; Kelley McNish, Bristol, Tenn.; Peter A. Nenzel, San Francisco, Calif.; and R. J. Schafer, Pinconning, Mich.

Pioneers Elect Simner President

THE ANNUAL meeting of the Independent Telephone Pioneer Association (ITPA) was held in the Grand Ballroom of the Conrad Hilton Hotel, Chicago, October 13.

Directors elected to three-year terms on the ITPA board are: Hugh A. Barnhart, Rochester, Ind.; Bertha M. Eaby, Ephrata, Pa.; and C. E. McCormick, Johnstown, N. Y.

Other directors serving unexpired terms are: Ray J. Alter, Galesburg, Ill.; Douglas S. Guild, Honolulu, Hawaii; Geo. A. Hearne, Kansas City, Mo.; Kenneth L. Lawson, Lincoln, Neb.; F. H. MacGougan, Monrovia, Calif.; and Berney Simner, St. Louis, Mo.

Berney Simner, St. Louis, Mo., was elected ITPA president. Other ITPA officers are: Vice President, F. H. MacGougan, Monrovia, Calif.; Vice President, K. L. Lawson, Lincoln, Neb.; and Executive Secretary and Treasurer, Mayme Workman, Springfield, Ill.

ance, they might well encounter hostile attitudes engendered by ignorance.

Viewed in this light, the advertising program becomes a form of insurance which many companies may never need, but which some of the companies — getting into difficulties — will need very much. I believe that our advertising program has brought a sense of prestige for the Independent telephone industry, along with making the public aware of its existence. Such a prestige appeal is bound to elevate employe morale and make life easier for all Independent companies, not only with their own subscribers, but with the regulators, legislators, financial interests, and others with whom they must come in contact.

Finally, it is, I believe, an absolute duty on the part of all business to keep the public informed of what it is doing to justify its existence. Twenty years ago Bruce Barton said: "No major industry has the moral right to allow itself to be unexplained, misunderstood, or distrusted . . . It not only hurts itself but poisons the pond in which we all must fish."

We have substantial proof that our national advertisements have been successful in identifying the Independent telephone industry in the public mind, in providing expansion capital for our companies, in promoting a better atmosphere for more adequate rates of service, in attracting capable personnel, in building good will and public confidence, and in promoting the American system of free enterprise.

Profit Boosters

AND THAT brings me to another very important Association activity, namely marketing, sales and merchandising. It is a matter of common knowledge, I think, that the United States has the greatest saturation of telephones of any country on the face of the globe. However, it becomes increasingly evident that the appetite of the American public for more and better telephone service is ever increasing. To make certain that our companies can meet the demand with an adequate supply and thereby substantially increase their profits, our Telephone Marketing Committee has shown itself to be alert to the opportunities. It has been aggressive in its plan of action to assist our people to take advantage of these opportunities in the field of selling.

The Marketing Committee's purpose is "profit-boosting through idea-sharing," and its philosophy of marketing and sales is embodied in the slogan, "Effective Marketing Means More Sales, Better Service, Greater Profits," which is being appropriately brought to your attention during this 62nd annual convention.

The committee has expressed the hope that those companies which have not yet undertaken adequate marketing and sales programs, including intensive training of employes for this purpose, will take a page out of the book of the Bell System, of General, of United and some of the larger Independents. Their programs have proved definitely and conclusively that very substantially increased revenues of a continuing nature are available to any company which embarks upon an effective merchandising campaign. It is the purpose of our Association to lead and show the way in these matters and to act as a clearing house of ideas. By taking up where we leave off, state associations, other Association committees and individual companies will be able, we are sure, to implement the activities of our imaginative and enthusiastic Telephone Marketing Committee.

In the past, many of our companies have relied heavily on the sales of private lines and extensions. We have depended largely upon "demand contacts" — those made by the customer, not the company — to make our sales. Experience has shown that we can successfully develop among residence customers company-initiated private line service sales. According to marketing and sales experts, there is no reason why we cannot continue to develop added revenue through the use of "scheduled" contacts (those made by the company). In many instances, existing subscribers are unaware of their own needs. Even when they are aware of them they too often are not fully informed about the facilities and services their telephone company has to offer.

Most of us overlook the fact of what a big advantage we have in selling our new products and services. Our sales men and women are always given close attention when the subscriber is called over the telephone. Our installers are welcomed inside the home, instead of stopped at the doorstep, and every member of the family joins in a telephone planning conference with them. No other salesman has such an opportunity. I wonder how many of us are missing out on making an approach. Remember the door is always open for us.

According to some of our companies which have had experience, approximately one-third of the sales contacts handled by their marketing and sales organizations were made at the customers' request. The remaining two-thirds were conducted on a scheduled basis by the marketing and sales organization. A comparison of results shows that the scheduled contact increased average annual revenue 26 percent, while the demand contacts resulted in an average annual increase of only 13 percent, or about half as much.

So marketing and sales people now are concentrating on pushing all the equipment and services we have to offer, including primary service, additional telephones, color telephones, portable telephones, paging systems, gongs, extension bells, switchboard and dial telephone systems, answering and recording devices, school-to-home services, directory listings, and so forth. Our Committee on Telephone Marketing recently issued a list of 34 new products and services which can be sold to your subscribers — all to your own profit.

Contacts With Subscribers

AND RIGHT here let me remind you that with all these advancements in telephone automation we get farther and farther away from daily contacts with our subscribers. The good old days of giving information, visiting and listening to the subscribers' troubles by our

switchboard operators has faded into the past. This makes it imperative that all of us promote active public relations and give it priority next to good service.

Every day, week or month we must advertise in the newspapers, use envelope inserts, make personal telephone calls and talk to civic and commercial organizations. Let everyone know of your capital investments, of your improved services, and of your growing subscriber list. Also if your service is impaired by sleet storms, hurricanes, severed cables and other causes beyond your control tell the public about it. Then you will have the people and the newspapers on your side when you find it necessary to file for new and higher rates. Public relations grow more important to our business every day. Don't neglect them.

There are many other activities of great benefit to member companies that our Association is engaged in and in which it will continue to be engaged through its officers and directors, its fulltime Washington staff of specialists, and its uncompensated committees. They include efforts to increase the exemption under the Securities Act, attempts to obtain radio and microwave frequencies for Independent companies, the conduct of USITA-sponsored engineering and management development schools, and, last but not least, the ever-increasing work load of our Committee on Military Liaison.

An idea of just how important are your Association's activities in these matters can be gained from the fact that an investment of more than $2 billion by the communications industry will be involved in connection with nationwide communication systems for the military and federal civilian agencies. More than 200 of these SAGE and other defense program installations are being or are scheduled to be located in Independent territory.

Our Association is engaged in numerous other activities in the general interest of all our member companies. Suffice it to say that we are progressing and growing, as witnessed by the fact that our membership has increased by 200 companies during the past four years. The heart of USITA is big enough to embrace the interests of all companies, be they large or small, regardless of whether they get their money to operate from banks, lending institutions, manufacturers, insurance companies, or REA. As a matter of fact, 204 REA-financed companies are now members of the Association, and nine members of our Board of Directors are REA borrowers.

The Future

SO MUCH for the past and present. Now, what is there to be said for the future?

First of all I wish to welcome our two new states, Alaska and Hawaii, to our union, and point with pride to the fact that they both are served entirely by Independent companies. Looking ahead I can see that we will work even more closely together as communications demands between old and new states continue to grow.

Personally, I feel that we are in the most interesting

TE&M's editorial staff held a conference during the recent USITA Convention. Shown above (l. to r.) are: DICK REYNOLDS, production manager; JOHN S. REED, technical editor; ALLAN R. STACEY, Sunland, Calif.; D. A. PERIGO, Everett, Wash.; C. D. EHINGER, Decatur, Ind.; BILL CORMAN, Atmore, Ala., and JOHN G. REYNOLDS, editor. Mr. Ehinger and Mr. Stacey were elected to USITA board of directors at the convention.

JOHN BISCHOFF (left), Verona, Wis., meets with G. G. TOLLEFSON, Mt. Jareb, Wis., during the USITA Convention.

Members of this USITA Convention group are (l to r): CHET REYNOLDS and J. D. YOUNG, Chicago; W. L. MOLLANDS, Atlanta, Ga., and C. H. KNAPP, Rochester, N. Y.

and the most promising business in existence today. Although we have made significant strides over the years, I believe along with many others that the brightest era and the largest opportunities lie ahead.

We can, to some degree, predict the future by looking at the past and then drawing certain conclusions. A couple of months ago as president of your Association, it was my happy privilege to give what was called "The Commencement Address" to our Management Development School graduates at the University of Kansas.

I reminded them that when our mothers and fathers were in high school not one of them had ever heard of bubble gum or bulldozers, of frozen vegetables or fiberglas, of bobbysoxers or the United Nations, of Formica or the four minute mile, of foam rubber or food freezers, of jet airplanes or Polaroid cameras, of electric razors or radar, of the atom bomb or drive-in movie theaters, of electric typewriters or color television, of toreador pants for women, for which they can be thankful, or automatic transmissions for the family car, or Direct Distance Dialing and pushbutton telephones.

These things have meant great changes and we can expect more of them. Now, while I am strictly against sin and in favor of progress, when I see these many changes coming so fast I feel as though I was born 30 years too soon. I am inclined to sympathize with a certain centenarian who was being interviewed by a newspaper reporter. The reporter said to the old gentleman, "Sir, you must have seen a great many changes during your hundred years." The old man replied, "Yes, and I've been agin all of 'em."

Now, as the American economy is once again pointed toward a decade of unprecedented growth and development on every front, here are some of the developments we can expect to see during the next few years: a single communication system in your home, combining telephone, television and radio; your TV screen will be a flat panel hanging on the wall; there will be radar steering on your automobile; machines will type spoken words directly on paper, and other machines will translate foreign languages as fast as they are spoken. These are only a few of the high-spots because the new products of the 1960's will extend across the entire spectrum of science and engineering.

Today we are on the eve of the most dynamic era in history. Automation is coming so fast it is impossible for us to keep up with it. But I know of one executive (not a telephone man) who quieted the fears of his rather voluptuous secretary who had all the curves in the right places by calling her into his office and saying, "You quit worrying about your job, young lady — no machine will ever take your place."

But seriously we can only faintly conceive what is ahead of us when we realize that this year business, government and our educational institutions are spending 9 billion dollars on research and development. It is estimated that $120 billion will be spent on research in the next decade, more than the national total investment in science from 1776 down to the present moment. This

Members of this USITA Convention group are (l. to r.): Mr. and Mrs. JOHN MEYERS, Chicago, and Mr. and Mrs. R. K. EATON, Fairfield, Ia.

means that many things and processes, which will be developed in our lifetime, will dwarf the advancements we have made in the past 30 years.

But one thing we must not overlook. With all this technical progress we must develop people who can manage the business. This is the most important thing of all. Unless it is done all efforts go for naught. All of this then can be summed up in the words of the late Charles F. Kettering, who said, "My primary interest is in the future because that is where I expect to spend the rest of my time."

How are we going to meet the challenges that these achievements in science and changes in our way of life are certain to bring about?

Well, of one thing I am sure: if we work with others, if we work together, we can attain every goal we can ever dream of. The story of communications, I am convinced, has only begun. As the story unfolds in the years ahead, we must continue to do our utmost to assure the very best for our customers, our employes, and our shareholders.

We can accomplish our goals and achieve our purposes by coming together — just as we are doing today — by thinking together, by planning together, by working together.

A long time ago, John Donne, the poet wrote:

"No man is an island in himself; he is part of the main land.
If a clod be washed away, Europe is less.
Any man's death diminishes me.
Never send to know for whom the bell tolls;
It tolls for thee."

What did John Donne mean? We live in and through every man's life. We die in and through every man's death. Even our souls are in the same boat.

Yes, how true it is — no man is an island. You know and I know that the work our Association has done and the goals it has been able to reach are not the product of any one man's genius. We are fortunate in having in our industry many qualified men who have intense loyalty to the business in which they are engaged. In any balance sheet one might draw up we would certainly have to put down as the most valuable item on the asset

side the understanding, the enthusiasm, the zeal and the fidelity of the men and women of Independent telephony who are making real contributions year in and year out to the effectiveness of our Association. Let us never lose sight of that fact. And let us not discount ourselves as individuals either. When I explore the God-given powers all of us possess, as individuals, I like to think that:

"I stand at the end of the past, where the future begins, I stand,
"Emperors lie in the dust, and men may live to command;
"But greater than rulers unborn, and greater than kings who have reigned
"Am I, that have hope in my breast and victories still to be gained.
"Under my feet the world, over my head the sky,
"Here in the center of things, in the living present am I.
"Under my feet the world, wrinkled, scarred and old;
"Over my head the stars, distant, pale and cold;
"Back of me all that was of the limitless past,
"The future waiting beyond, silent, untenanted and vast;
"And I am the link 'twixt what has been and is yet to be;
"The hope of humanity waits, while its destiny hinges on me."

Ladies and gentlemen, I would like to repeat what I have said on a number of occasions during the year, and that is how grateful I am for the honor and confidence which you have had in me. I would also like to thank the officers and directors of the USITA and all those who served on committees or otherwise helped, by appointment or request, in the work of the Association during this past wonderful year.

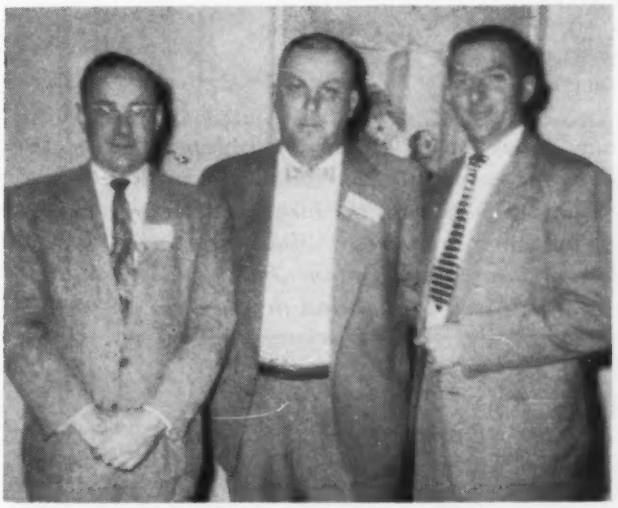
All together these groups held over 75 separate meetings during this administration. The assistance, cooperation and enthusiastic support of our state association secretaries, staffs and members has been a great help to us. In the past three years I have attended many state conventions so I know from actual experience what your work has meant to the telephone industry.

And I also want to express my gratitude to the members of the USITA staff in Washington headquarters. They have work and responsibilities that increase constantly but I know they are assuming the load and doing an excellent job.

Without the generous cooperation of all these members, often performed at a considerable sacrifice of their own time and effort, we simply could not have carried out our program. All of us are tempted to take things like this for granted. But now that my own tour of duty is nearing its close, I want to go on record as stating that never once did I fail to get all the help and cooperation I asked for.

Again may I say "thank you all very much" as I salute you in this — Independent telephony's finest hour. — *Hugh A. Barnhart.*

T. DEWITT TALMAGE (left), Chicago, visits with JOHN S. REED, Lincoln, Neb., during recent USITA Convention. Mr. Reed is TE&M's technical editor and Mr. Talmage is a popular TE&M author.



Iowa Independents attending the USITA Convention included (l to r): FILMORE MELICK, West Liberty; W. C. DAUBENDIEK, Jefferson, and JOHN H. NATH, West Liberty.

USITA Directors (left to right): HAROLD G. PAYNE, Export, Pa.; EARLE G. BELLAMY, Knoxville, Ia.; HAROLD R. BOLLINGER, Waconia, Minn., and R. J. FEGAN, Junction City, Kans.

Exhibits on fifth and sixth floors of Chicago's Conrad Hilton Hotel attracted thousands of USITA Conventioners.

Report From Washington

By CLYDE S. BAILEY*

Executive Vice President,
U. S. Independent Tel. Assoc.,
Washington, D. C.

√ Revenues of each of 96 Independent telephone companies exceeded one million dollars in 1958, with the largest company grossing more than $92 million, and in another year many more Independents will graduate into the million dollar class.

ONE HUNDRED and eighty-three years ago the United States of America became an independent nation. One hundred years later, in 1876, Alexander Graham Bell was granted a patent for the first telephone. Upon the expiration of basic Bell patents in the early 1890's, Independent telephone companies, which had already appeared here and there, increased in numbers. Sixty-two years ago, in 1897, the U-S-I-T-A was born when a group of hardy pioneers met in Detroit and founded an organized movement for the protection of their common interests at the national level.

At that time Grover Cleveland had just surrendered the reins of presidential office and William McKinley had become the nation's chief executive. The population of the country was less than 75 million. The total number of telephones in the country was about 900,000. Today the number is 67,000,000. The 2,200 Independent telephone companies then in existence were due to increase to 9,200 by 1922, and later through mergers and consolidations they were due to decrease to 3,867 by 1959.

**Adapted from Mr. Bailey's report to the 1959 USITA Convention.*

The number of Independent telephones has increased year by year until today the total station count for our branch of the industry is well over 10,000,000. This is more than double the number at the end of World War II.

Without minimizing the great achievements of our big brother, the Bell System, it is well to remember that over the years some noteworthy advances in the communications art have come from the laboratories of Independent manufacturers and from operating companies. The most outstanding example is the dial telephone. Others include the telephone hand-set, direct distance dialing, and mechanized toll ticketing. There are many more. Both branches of the industry are of course working for the common goal of providing the best telephone service for the largest number of people at the most reasonable cost.

Although from our Association's widely circulated pamphlet, *An American Story*, the figures are somewhat familiar, in a report of this kind it may be well to set out the following tabulation showing the relative size of the two industry segments as of January 1, 1959.

	Bell System	*Independent*
Total telephones	56,759,000	10,184,800
Number of operating companies	23	3,867
Number of exchanges..	7,300	10,765
Investment in telephone plant	$21,253,378,000	$3,077,076,800
Gross revenues	$ 6,937,916,000	$ 794,003,500
Number of employes ..	606,340	98,300

Another year has passed since we last met in annual convention. More stations have been added. More plant has been constructed. More money has been invested. Communication frontiers are being pushed back farther and farther. Revenues are at an all-time high. Technological advances are going forward. Conversions to

dial operation are proceeding rapidly. Within seven years all Independent telephone companies could be dial operated. Eighty percent of all Independent phones are already dial.

The revenues of each of ninety-six Independent telephone companies exceeded one million dollars in 1958, with the largest company grossing more than $92 million. In another year still more companies will graduate into the million dollar class. But the smaller companies will still be important parts of the economic and social life of thousands of towns and communities in which they provide an essential service. Growth of all kinds has taken place also in the Bell System. Seemingly there is no end to the demand of the American people for more and better telephone service.

There are about 125 million telephones in the world, of which 54 percent are in the United States. New records are being made each year. The challenges of the future are large. Anyone wanting to know whether the leaders of the industry are optimistic and whether opportunities for investment, for employment and for service in the broadest sense are available in the telephone business in the years to come, would do well to read the interesting series of articles that appeared in the 50th anniversary issue of July 15 of *Telephone Engineer and Management*. Aside from my own article, it is an inspiring experience to read what important people in our businesss think our problems and our opportunities are going to be in the next half century.

Legislation

IN THE paragraphs which follow I shall refer to various pieces of legislation with which our Association has concerned itself during the past year . . .

(a) Telephone Excise Taxes

Although repeal of the telephone excise taxes could not be achieved, some definite progress was made when Congress set a termination date of July 1, 1960 on the local service and telegraph taxes. This was done as an amendment to a bill which extended for another year the 52 percent corporate income tax rate and certain excise taxes due otherwise to expire in 1959. An amendment had been fathered by Senator Kerr (D.-Okla.) to set a termination date on both local and long distance taxes, but a conference committee limited the amendment to the taxes on local exchange and telegraph services.

Disappointing though it was that outright immediate repeal of the taxes on both local and long distance could not be obtained it was understandable on sound fiscal grounds why Congress did not do more. It was faced with a $12 billion deficit, and repeal of the excises on our business would have increased the deficit by $700 million. Repeal of the tax on local service alone would come to about $325 million.

Senator Kerr has stated he will make an effort next year to obtain repeal of the tax on long distance service also.

Whether the Senator's effort will succeed, indeed whether the tax on local service will actually go off on July 1, 1960, must depend upon the state of the federal government's finances. We shall hope they will be such as to permit an end to these inequitable levies, levies on an essential service that were supposed to come off at the end of the war. Users of telephone service all over the country can help to insure their coming off by insisting loudly and firmly that government cut down on its expenditures. This is the key.

When the tax extension bill was pending, our Tax Committee and Association officers received splendid support and cooperation from our member companies, State Associations, and the twenty-five special tax committees set up by State Associations to render specific help on excise tax repeal. All of this aid was much appreciated. . . .

(b) The Switchboard Operator Exemption

Some fifty or more bills were introduced at the last session to rewrite the Wage-Hour Act by increasing the minimum wage from $1.00 to $1.25 or $1.50 and repealing or limiting various exemptions. No hearings were held by the House Committee on Education and Labor, but hearings were resumed and completed by a Subcommittee of the Senate Committee on Labor and Public Welfare.

Senator John F. Kennedy (D.-Mass.) is the principal proponent of changes in the law. His bill, S. 1046, was reported by a Senate subcommittee to the full committee but the latter was unable to muster a quorum and hence did not report to the Senate. This bill is a bad measure and is being opposed by a number of industries because of its proposed wage increase and treatment of exemptions.

The bill would dilute the switchboard operator exemption by making it apply only to operators who operate boards in their own homes. Even in this emasculated form the exemption would be available only to companies grossing less than $750,000 a year, the same dollar limitation that would apply to other exemptions. Your Association has advised Senator Kennedy and the Senate Labor Committee of the objections we entertain to these provisions as well as to the proposed increase in the minimum. At the Senate hearings in May, Chairman Clyde McFarlin of our Employment Relations Committee presented the viewpoint of the Independent industry.

In the case of telephone companies (and other businesses) grossing more than $750,000 a year and presently having the benefit of an exemption, the Kennedy bill would increase the hourly minimum by the following scale:

1st year	$1.00	46 hours
2nd year	$1.10	44 hours
3rd year	1.20	42 hours
4th year	1.25	40 hours

Although for some years the Eisenhower administra-

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USITA Conventioners (l to r): ROBERT NOVAKOWSKI and R. B. WISEMAN, Elkhart, Ind.; A. L. FALK and EVERETT WEITZELL, Washington, D. C.; J. W. CHANNELL, El Monte, Calif., and ROY F. SMITH, Chicago.

"Take A Giant Step"

By DAVID A. HAMIL*

Administrator,
Rural Electrification Administration,
United States Department of Agriculture,
Washington, D. C.

A LONG TIME ago, when we were very young, some of us played games in the school yard or on the corner lot or down by the barn. In one game — the name has long since escaped me — the children took various kinds of steps and strides assigned to them. There is a phrase that clings to the memory of some of us: "Now take a giant step."

We stopped playing games many years ago, but it seems to me that in the more serious responsibilities we undertake as we build our lives there are times when things we learned as children still apply. At some point in the last 10 years — this decade of REA's telephone program — each of you said to yourself, "Now take a giant step."

Changes In Doing Business

THE GIANT STEP meant assuming indebtedness for a half-million dollars — much more in many cases. It meant for many of you a turning away from magneto service which had been familiar for so many years to intricate dial. For some it involved expensive engineering, a tremendous construction project, a new accounting system, hiring specialized personnel, revised tariffs, and scores of other changes that mark transition from a small enterprise to a big one. It is a giant step to double and triple the number of subscribers and your investment. And it is a giant step to tie together farm and market town with modern telephone service in an area-wide system.

For REA, too, the 10 years of rural telephone loans program that will be observed October 28 by ceremonies in Washington represent a giant step. In the closing months of 1949 there was only the amendment to the Rural Electrification Act and the beginnings of a staff for administering the new telephone loans program.

Many people in the telephone industry were wary of an agency of the Federal government becoming involved in any fashion with our very Independent private telephone enterprises. A few were downright hostile. That was 10 years ago. You and I have come a far piece, haven't we, as we talk together here today? Mutual confidence that all segments of the telephone industry could work together to get adequate service to the rural areas — mutual confidence that Government could provide you with a service and not interfere unnecessarily in your business operations — this has indeed been a giant step.

Rural Subscribers Expect More

THE PEOPLE you serve have been making some long strides, too. Some of you remember the farmer who paid 75 cents a month for his crank-type telephone. Well, you know he is willing now to pay adequate rates. And you know also that he has come to expect modern dial station equipment as standard. He is not content now to wait his turn to talk to the neighbor down the road. The good service you have permitted him to sample has become his standard fare, and he expects to dial a city 500 miles away and get instantaneous connection and perfect reception for market information or a chat with relatives. Yes — subscribers, too, have taken a giant step.

Not all of them, of course. About 40% of our farms have no service at all, and about a third of the remainder have service that is inadequate by modern standards

Mr. Hamil presented this paper at USITA's 1959 Conference of REA Borrowers.

of the industry. The greatest gap, though, is not farms alone, but in non-farm rural homes, thousands of crossroads communities and very small towns, and a host of rural industries that are somehow limping along with overcrowded lines, with manual switchboards manned 12 or 18 hours a day, and with special toll charges to talk to business people in the nearby town.

Much of this is found in small pockets which nearby systems seem unable or unwilling to serve with modern dial. Part of the trouble is in the very smallness of some existing telephone organizations. They are too small to find adequate capitalization, and they are too small to hire the experienced personnel needed to operate a modern business efficiently.

What Is "Too Small?"

YOU ASK HOW small is "too small?" We can't tell you. The border line between a feasible system and one that is not is difficult to fix. Whether a telephone organization can justify enough long-term investment to rehabilitate and continue its existence does not depend solely on its number of subscribers.

You are telephone industry men, and you know this situation well. You have demonstrated to REA that the really critical ingredients to success are the potential subscribers, the economic future of the area, and, most important of all, sound business management.

Importance of Potential

I WANT FOR a moment to enlarge on each of these three factors. When you came to REA with an application for a loan, we were not so much interested in how many subscribers you had as we were in what potential there would be in the territory you intended to serve. And we were not so much interested in what your revenues had been as whether adequate rates for the new service would yield sufficient revenue to pay off the REA loans and leave enough margin to make the enterprise secure.

Closely tied to the number of potential subscribers is the economic capacity of the area. A few parts of the country are slowing down economically for a variety of reasons. This is for the most part a local phenomenon, and the Rural Development Program which the U. S. Department of Agriculture is carrying on with local agencies in depressed counties is designed to overcome some of the local handicaps. In most of the country the population is increasing. Business is prospering, people have more money, and there is more demand for first class telephone service.

What We Have Learned

IN THE LAST 10 years all of us — even men who have been in telephony all their lives — learned something about the service they offered. That discovery was part of the giant step: that rural people were not much interested in cheap inadequate service. In other respects, people in the country were getting accustomed to living like their city cousins. They were acquiring the best machinery and tested scientific methods to do their farm chores. Electricity helped change the whole way of life on the farm and in the rural community, with radio and TV, all-electric kitchens and air conditioning. Good cars and paved highways provided quick transportation. The handcrank, whoop-and-holler telephone box today is an anachronism, no matter how sentimental we want to be about its place in the history of the industry.

Today, you are marketing a product that people want — modern dial telephone service, with private lines and graded service. Even your multi-party rural service is limited to 8 parties, with full selective ringing. The farmer can have service around the clock. He knows he can depend on it. This is a giant stride forward.

Your sales program is showing the farmer new ways to get full use of his telephone — with savings to him in time and money he used to spend in trips to town. Extensions on the farm at small extra cost permit him to keep his whole farming business running with factory efficiency without sacrificing the benefits of country living.

Higher rates for a better service, good saturation of stations per mile of line, and increasing population — these are things that count in establishing feasibility.

Quality Of Management

YOU AND I understand how important the quality of management is in carrying forward the rural telephone program. I have to run my ranch efficiently or I wouldn't be in the cattle feeding business long. You are here at this meeting today because you know how to turn out a better kind of telephone service more efficiently than someone else.

In some respects telephony has become more competitive. There is interest now in what can be done with worn-out systems in isolated areas. There is someone watching and waiting to buy up the telephone facilities and service area rights from anyone not able or willing to do the best possible job. This is evident in the changing statistics on the Independent telephone industry. We are down to about 3,800 Independent companies today, but many of these are stronger than ever before. The great stride forward being taken by the Independent industry is dropping mediocre management by the wayside.

We are glad to see your systems expand, because your larger resources permit you to pick up and spread the costs of service in thin rural areas more easily. We are depending upon creative engineering and imaginative management to find more economies in construction and operation so that unserved pockets may be reached.

Economies In Working Together

SMALL COMPANIES and cooperatives as well as the larger ones can pick up responsibility for better area coverage by working more closely together, where

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USITA Conventioners (l. to r.): PAT LAWHORN, Chicago; AL TEIFELD, Pittsburgh, Pa.; R. D. MOORE, Dayton, Ohio; ED BOERKE, Minneapolis, Minn.; and USITA Convention Speaker L. W. ROBELLO, general plant manager, Hawaiian Tel. Co., Honolulu.

Communications For

North American Air Defense

By COL. HOWARD S. GEE*

Chief,
Communications Systems Division,
Air Defense Command,
Colorado Springs, Colo.

√ The telephone industry plays a vital role in the electronic ground environment portion of the North American Air Defense System and the "need is great for new ideas and means to reduce communications vulnerability" in case of attack.

SIX THOUSAND years ago man gazed fearfully at the skies and saw little more than the terrifying powers of the unknown.

Today man may gaze upward proudly and confidently at suns and moons and planets which he has analyzed and even weighed with considerable precision. He can also see star-like bodies which he himself has hurled into the heavens. Yet the greatest challenge in all his history is ahead of him — but not far away — flight into terrestrial and interplanetary space.

The scientific progress which we have experienced since the beginning of recorded history is indeed amazing — even more amazing is the rate at which it has occurred during recent years.

If we could imagine a clock so geared that it takes 6,000 years for one revolution of the minute hand, then the clock I have in mind would depict our relative progress. For instance, about 50 minutes ago the Great Pyramids were under construction; 20 minutes ago Caesar was in power; only five minutes ago Columbus announced his discovery of America; and less than one minute ago Faraday produced the first successful dynamo.

Look at the advancement which has taken place in the last 60 seconds. Without naming them all, we can point to radio as coming into being about 40 seconds ago. The first hydrogen bomb explosion occurred within the past five seconds. And today we stand on the threshold of space flight.

Communication-Electronics And National Defense

NOW LET'S get back to sidereal time and review what has actually happened within the past few years, and that which is predicted for the future with respect to communication-electronics and National Defense.

There has been an almost unbelievable advancement in the military importance of electronics. Twenty-five years ago the military application of electron-tube devices was limited mainly to radio communications. Today electronics controls the effectiveness of every offensive and defensive weapon that our armed forces use.

Reviewing the technical history of military electronics reveals that this rapid expansion was not so much the result of a single technological breakthrough as it was the systematic application of a great many advances in

**Colonel Gee presented this paper at the 1959 USITA Engineering Conference.*

electronic components, circuit techniques and engineering methods.

In selecting some of the individual developments that exerted the greatest influence on the advancement of military electronics, one would certainly include the magnetron, the shock resistant subminiature tube, semiconductor devices, subminiature equipment construction, the fundamental logic of the digital computer, the discovery of tropospheric and ionospheric propagation.

One would easily predict that some pretty fantastic military uses of electronics in the next twenty-five years will influence our military weapons and concepts of warfare to a still greater extent than before.

Some technical experts seriously predict that within five years the application of microcircuitry technology — "molecular electronics" as some prefer to call it — will permit packaging in a 3-inch cube an entire computer having the capacity of a million words and with no detachable components.

Computers of many types will find new uses in military operations. Coupled with new worldwide, high speed communications circuits, computers yet to be developed will analyze massive amounts of technical data under several different action conditions in a matter of microseconds. With this kind of background, a commander will be able to determine the optimum course of action under known circumstances.

Space-Age Communications

MANY authorities believe that the future of communications is closely linked with outer space and that we will open new channels that will again expand our communications band width. The civilian applications of these gains will be as significant as the military.

We may soon be communicating around the world by means of radio signals relayed by the passive or active repeater type earth satellites. The space age may make it possible to span the oceans with live television programs and for generals to watch a battlefield half way around the globe.

Signals may be relayed across the ocean by reflection from passive satellites — giant spheres, high above the surface of the earth or great flat mirrors oriented to reflect ultra short waves back to earth. Alternatively, messages may be relayed from active radio repeater stations similar in principle to those used to transmit signals across continents but elevated into satellite orbit so that one repeater can serve where it now takes dozens to cover a few thousands of miles.

The possibilities are legion. The problems are also legion, so it is only fair to ask just where we stand today and which of the many possible systems looks most practical for present day technology.

One of the disagreeable features of repeaters at a few thousand miles altitude is the fact that they must be acquired and tracked as they streak rapidly across the sky, and the very large ground antennas must be capable of switching rapidly from satellite to satellite to maintain a continuous circuit.

A most exciting prospect, therefore, is the possibility of the 24-hour repeater which remains stationary in the sky. With such a satellite, stationary ground antennas can be used and only three satellite relay stations are required to serve most of the world. Establishing such a repeater station will be a scientific achievement of very high order and yet the time when it can be accomplished may not be many years away.

At first, 24-hour repeaters will probably be of low power and useful only for point-to-point communications between very large ground stations. Eventually, as space becomes more fully conquered, one can imagine very powerful repeaters with large antennas capable of interconnecting multitudes of small mobile and fixed ground stations.

EDITOR'S NOTE

Sorry we had to omit our regular feature departments from this issue. They will all be back in your November issues of "Telephone Engineer & Management."

The impact of such a facility upon tactical warfare can scarcely be imagined. By use of small directional antennas which can be pointed to a known part of the sky, it will be possible for aircraft, submarine or mobile troops to communicate with headquarters through the satellite repeater. It may be that the most important part of future warfare will be the maintenance and defense of such satellite repeater stations.

Intermediate (1,000 or so miles) altitude repeaters providing transoceanic communications between large satellite tracking communication terminals which are connected to existing telephone and television networks are further away but technically feasible.

It very likely will be an accomplished fact within a few years. Whether or not the relays are active or passive depends critically upon the development of long life satellite components, the relative economics of rocket vs. ground station cost, and questions of reliability in the presence of man-made interference, both intended and unintended. There are as many well-considered opinions as to the outcome as there are possibilities.

The North American Air Defense System

NOW LET us briefly review what has actually happened within the past few years with respect to the electronic ground environment portion of the North American Air Defense System which is so essential to our survival in the face of air attack. It is here that the Telephone Industry plays such a vital role.

The early Air Defense studies were made by some of the nation's most eminent scientists, and the findings of this group resulted in a contract between the Defense Department and Massachusetts Institute of Technology for the establishment of Lincoln Laboratories.

This agency was in turn to develop an air defense system which would meet the newly established air defense requirements — largely characterized by speed and positive control. The MIT Whirlwind

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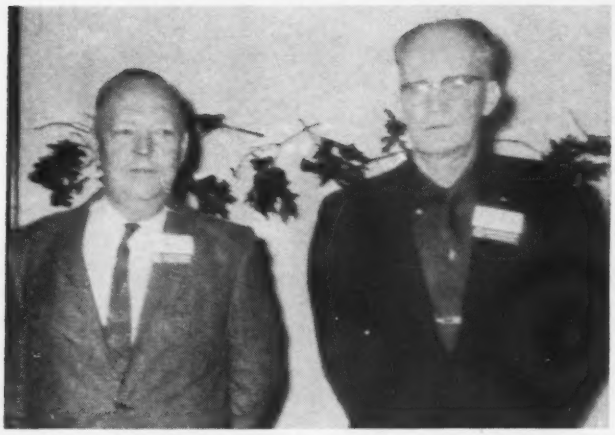

WILKINS LINHART (left), Fruitland Park, Fla., and J. M. ROGERS, Marianna, Fla., engineers with the Florida Railroad & Utilities Commission, attended the recent USITA Convention.

U. S. Air Force was represented at USITA Convention. Shown above are (l to r): GARLAND R. WALLACE; JAMES E. LOCKE; CARL D. WETHINGTON; J. WEBB, and W. M. WRIGHT.

Number Services Aspects

In Direct Distance Dialing

By RICHARD A. MATHEWS*

**Number Services Planning Engineer,
American Telephone & Telegraph Co.,
New York, N. Y.**

√ If the telephone industry is to reap the full benefits of Direct Distance Dialing, it must make the service attractive to its customers. This can be done by keeping uniformity in mind so telephone service is easy to use and is a pleasant experience for the user.

NUMBER SERVICES in many ways sounds like a catch-all phrase that includes almost anything that has a number in it. In the broad sense this definition probably would be about right. We think of it as the handling, dissemination, presentation, and the form in which telephone numbers are presented by the telephone company and by the customer. Number Services concern such diverse areas as customers' procedures for making telephone calls, information, intercept service, directory production, directory content and scope, public relations aspects, and facilities and tools needed to handle Number Services in the future.

Direct Distance Dialing requires a good deal of attention from those working with Number Services. The telephone industry through DDD is continually increasing the number of telephones that may be reached without the assistance of an operator. Making this expanding service both easy to use and more satisfying to the customer should encourage more and more usage. And complete knowledge of "How to do it," i.e., how to obtain numbers of distant telephones and how to call those numbers directly, is essential to satisfactory service.

Direct Distance Dialing is growing by leaps and bounds. By the end of this year about 15,800,000 telephones in the United States and Canada will have this service. By the end of next year it will be up near 23,500,000 telephones and by 1965 the job of furnishing DDD service to all telephones in the United States and Canada will be nearing completion. In addition to what is now known as DDD will be person-to-person, collect and credit card calls. Even world-wide direct dialing is within the realm of possibility.

Continued growth of Direct Distance Dialing is always calling for new approaches to Number Services. With growth, today's small annoyances could be major problems tomorrow, and today's problems could be unmanageable situations in the future unless steps are taken to meet this growth with new ideas and technology.

There are folks throughout the industry at work on various parts of the Number Services job. Mr. Paul Henson and the USITA Engineering Committee thought you would be interested in the things we in the Bell System are doing and are thinking about. These include ways to increase customer knowledge and use of area codes, improved directory instructions, area informa-

*Mr. Mathews presented this paper at the 1959 *USITA Engineering Conference.*

tion centers, microstorage of information records, and numbering plans.

Customer's Use Of Area Codes

ONE OF THE most vital aspects of Number Services can be broadly covered with a descriptive title "Customer Education." Through extensive surveys it is found that customers like to dial calls direct. To encourage this acceptance of DDD we in the industry must do everything possible to make area codes conveniently available to customers who need them and make certain that our customers understand the advantages and the use of area codes, particularly when to use them and when not to use them. I think you will readily see how some of the following things that we are doing will help matters.

EDITOR'S NOTE

USITA Convention papers not presented in this issue will appear in the November issues of TE&M.

First, we are trying to promote the customer's use of area codes as part of the telephone number when making long distance calls. Historically, in placing long distance calls customers have given the desired city and state and the telephone number. For example, Des Moines, Iowa, CHerry 3-9900. In the days of ringdown operation the name of the city and state was essential to the long distance operator since it directed her to a Des Moines circuit in the multiple. Since the conversion to operator dialing the name of the city serves little purpose. In fact, the operator must translate the name of the city back to an area code (515) either from memory or from routing information, must select the first two letters of Cherry and finally key into her equipment 515 CH 3-9900.

We think the time has come to promote customer placement of long distance calls using the area code and 2L-5N. This gives the customer faster service and in DDD cities makes it possible for him to place his dialed calls and his operator handled calls in a similar manner. It also reduces the costs of handling these calls since it eliminates the operator's reference to routing information and eliminates the need for writing the place name on the mark sense toll ticket.

We have already modified our Traffic Operating Practice in several places to put these ideas into effect. For example, under "*Outward*" the operator is told that "*If a call is placed by giving an area code followed by a central office name and five numerals, or by two letters and three numerals, or by seven numerals, with or without a party line suffix, accept it. . . .*"

Under "*Securing Routes, Rates and Numbers,*" the operator is instructed "*If the customer asks for the area code to reach a distant city, consult your routing information if necessary . . . . and give him the area code.*"

Information operators are instructed "*If a customer at a distant point asks what he should dial to reach telephones in a place for which you furnish telephone numbers, say 'If you can dial (place) direct from your telephone, the area code is* 201'. . . . "

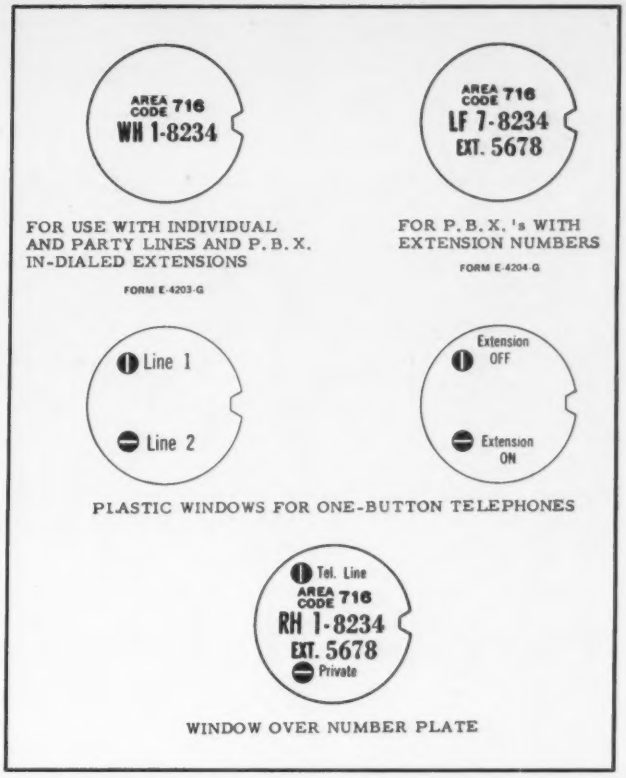

FIGURE ONE: — All station number cards, as they are replaced in conversions or station movement, show the area code as well as the number on a 2L-5N basis.

A foreign listing now looks like this:

Allied Building Cleaners
1410 Hmltn Ave Passaic NJ
Ask Oper for Passaic NJ GE 8-9970

The same listing as it will appear after the change:

Allied Building Cleaners
1410 Hmltn Ave Passaic NJ . . . . . 201 GE 8-9970

FIGURE TWO: — Some Bell System directories include the area code in foreign area listings.

We plan on encouraging customers to give their telephone numbers, including the area code, to people at distant points. To make this more natural, we recently recommended to the operating companies that all station number cards, as they are replaced in conversions or station movement, show the area code as well as the number on a 2L-5N basis. (*Figure One.*)

In addition to area codes on station number cards we are promoting the use of area codes as part of the telephone number on letterheads, bills, in advertising and on calling cards. We are starting in our own backyard with this one and some of you who are stockholders in the A.T.&T. Company probably noticed on recent correspondence from our Treasurer that his letterhead shows the area code 212 for New York City. Right now we are preparing brochures for long distance sales promotion and for distribution to the printing industry in

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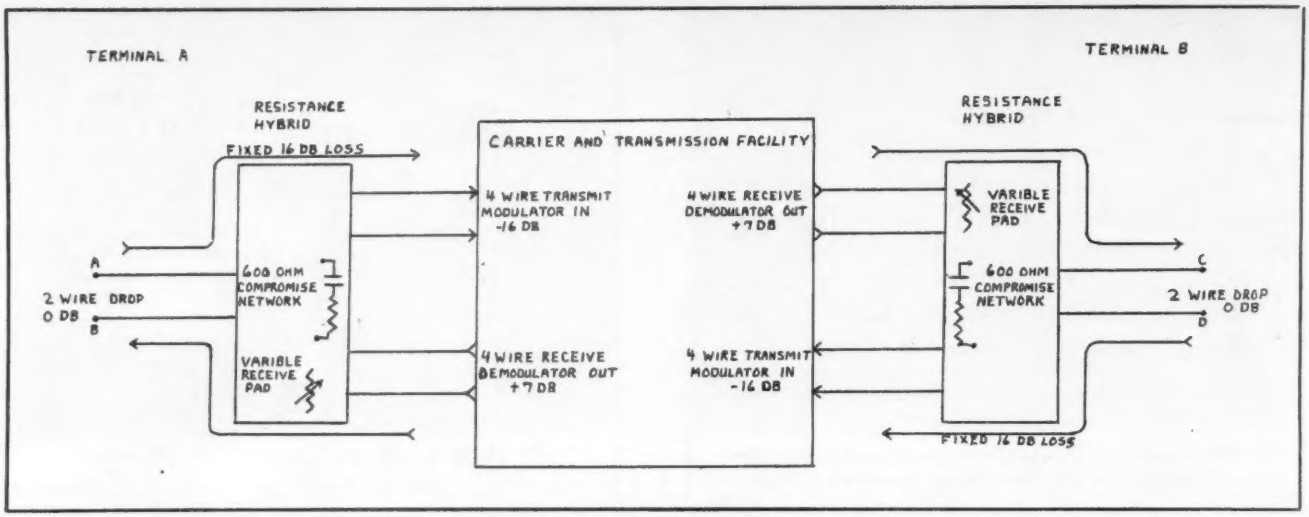

FIGURE A-1: — Block diagram of typical 2-wire terminated facility.

Carrier Maintenance and Test Gear

By PAUL E. MURPHY*

Superintendent of Electronics,
Telephone Service Co.,
Lima, Ohio

√ ***A major portion of the required interexchange facilities will be derived through the use of carrier, either superimposed on open wire, cable, or radio facilities, and adequate maintenance and test gear must be obtained and adequate test procedures must be adopted to establish and maintain facilities.***

WITH THE advent of the Nationwide Toll Dialing Plan, with its direct distance dialing, the S-A-G-E System, with its required special services and facilities, and with the multiplicities of other special services and facilities being requested by users of Telephone Company Communications Networks, comes the necessity of well-designed facilities. Of equal or perhaps even of greater importance is the necessity for well-maintained facilities, facilities maintained to their design requirement.

The necessity of well-maintained facilities in the art of Nationwide Toll Dialing stems from the fact that: (1) in many cases, there will be no operator present to observe and then to assist in reporting trouble when it should occur, especially when the customer may be direct dialing; and (2) the necessity of well-maintained facilities in the special services may be one of necessity to the traveling public or of defense interest, as are the conditions of F. A. A. and S-A-G-E.

A major portion of the interexchange facility requirements will be derived through the use of carrier, either superimposed on open wire, cable, or radio facilities. If we are to use carrier apparatus to fulfill these facility requirements, adequate maintenance and test gear must be obtained and adequate test procedures must be adopted to establish and maintain facilities.

During this presentation, I would like to elaborate on some of the more common test procedures and test equipments adapted by Telephone Service Inc. in the maintenance of carrier facilities.

First, let us discuss various tests performed in determining whether or not a carrier facility is functioning properly, whether or not actual alignment and trouble-shooting of the carrier facility is necessary. Tests normally include net loss measurements, channel frequency response measurements, noise measurements, and signaling tests for all types of facilities, with other tests necessary due to the design of the carrier utilized to provide that facility.

Net Loss Measurements

THE NET loss of a transmission facility is the difference between relative levels at the input and output of the facility. It is usually expressed in decibels (dbs) at a frequency of 1,000 cps. It is quite variable and

*Mr. Murphy presented this paper at the 1959 *USITA Plant Conference.*

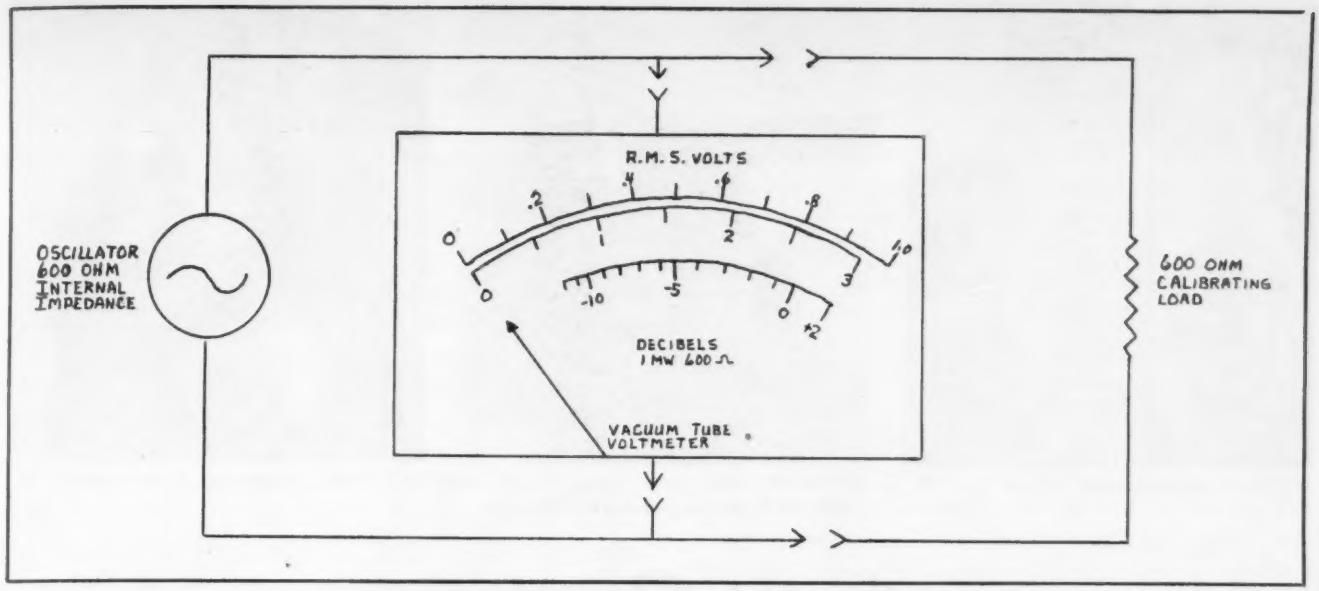

FIGURE A-2: — Calibration setup, sending end.

may range anywhere from so-called Via Net Loss for a voice grade facility functioning between two Toll Centers to —15 db for two and four-wire Full Period Talk services, as determined by the various engineering groups to provide a proper grade of service.

Figure A-1 illustrates a block diagram of a typical 2-wire terminated facility, for which it is desired to determine the net loss. Illustrated are the following assumptions:

(a) That the facility is terminated at terminals A & B;
(b) That the drop connection is at an O db point;
(c) That the two-wire drop impedance has been assumed to be 600 ohms.

Figure A-2 illustrates the required test equipment at the sending terminal of the facility and is shown set up for calibration. Let us discuss and qualify each component used in calibration:

(1) *The Oscillator*: The oscillator internal impedance should be 600 OHMS to simulate the impedance design of the facility at the point of termination or switching. 600 OHMS is representative of toll terminal impedance design.

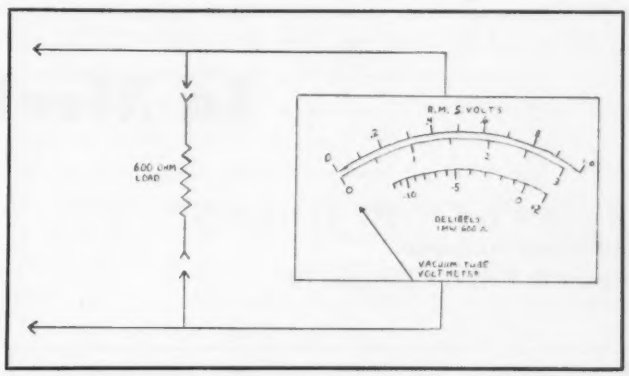

FIGURE A-3: — Net loss measurements, receiving end.

(2) *The Calibrating Load*: The calibrating load is an artificial load simulating the impedance of the facility again — 600 OHMS.

(3) *The Voltmeter*: The voltmeter illustrated is typical of the vacuum tube-type, utilized by the telephone industry for performing carrier maintenance. It is referred to as a V.T.V.M. and is calibrated to read in de-

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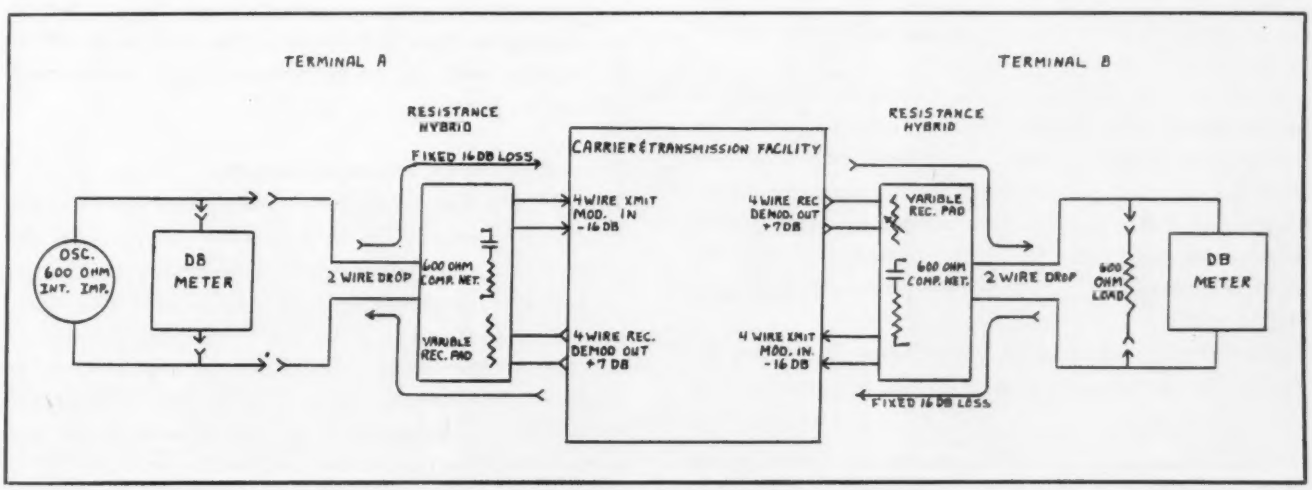

FIGURE A-4: — Typical setup for making end to end transmission tests on 2-wire carrier facility.

USITA Conventioners (l. to r.): W. C. DILLON, Van Nuys, Calif.; CARL DAUBENDIEK, Jefferson, Iowa; and A. H. BROWN, Bryon, Ontario, Canada.

Adequate Audit Trails

In Mechanized Accounting

By BRUCE P. OLSON*
Assistant Manager,
Ernst & Ernst, Chicago, Ill.

√ ***The introduction of machine accounting, whether electronic or mechanical, requires a reappraisal of the system of internal control to determine the adequacy of audit trails in the data processing routine.***

THE DEVELOPMENT of mechanized accounting in recent years has introduced a new concept of record-keeping into the field of accounting. Integrated data processing has had a profound effect on accounting procedures and techniques of recording, and this in turn has given rise to the reappraisal of the techniques applied by the auditor.

It is easy to understand the immediate reaction of bewilderment that the bookkeeper exhibits upon the replacement of his well-understood hand posted ledgers with the mystery of punched cards, magnetic tapes, drums and disks. As one after another of his journals, books of original entry and ledgers are thrown into the trash he realizes that figures he used to see are no longer visible to him.

Bewilderment changes to anger when he learns the figures he so lovingly checked off as they made their way through subtotals, totals, and grand totals into the final ledger are going to become holes in cards. Anger then dissolves into panic when he learns the cards with the punches will be fed into a computer and placed in a memory from which they will be erased and lost forever as they are replaced with up-dated information.

Is it any wonder that this bookkeeper would insist on some method of reconstructing his figures — that pathways or trails be left in the processing routine so that he can find some of his figures? Because of this there have been created many unnecessary and costly steps in mechanized accounting programs under the guise of providing audit trails.

The determination of the adequacy of audit trails in mechanized accounting programs is dependent upon two factors: the adequacy of the system of internal control and the existence of the machine accounting controls. It is appropriate then to review these factors before considering the type and extent of the audit trails which the auditor will ask to be included in a mechanized accounting program.

Development Of Internal Control

IN ITS INFANCY, auditing consisted of checking the clerical accuracy of bookkeeping records. As the years passed, businesses required the CPA to enlarge the scope of his engagement so as to include his professional opinion on the fairness of financial statements. It became important for the auditor to examine and investigate the nature of transactions in order to form the opinion he was being asked to give. He soon found that time no longer permitted him to continue the detail proof of clerical accuracy and at the same time inquire into the

*Mr. Olson presented this paper at the 1959 *USITA Accounting Conference.*

nature of a company's tranactions to form his opinion.

And so evolved the reliance upon the system of internal control which, after proper review for adequacy, would permit the auditor to test only selected transactions and certain of the clerical computations in order to form his opinion. As the complexity and size of our modern companies evolved, the testing of records became more and more important.

In the early thirties, auditing textbooks rarely mentioned the term "internal control." Reference was generally limited to a few remarks on internal check. One text of that time described internal check as "an accounting device whereby a proof of the accuracy of figures can be obtained through the expedient of having different persons arrive independently at the same result." The text went on to say that "a proper system . . . requires that the same result be obtained not only independently but also by employing a different method."

The public accounting profession was becoming aware of the significance of internal control and its relationship to the reliability of financial reporting and in the later part of the thirties the profession included the phrase "we have reviewed the system of internal control . . ." in the CPA's short form of audit opinion. At this point we advanced to the idea of a system rather than a device and to control rather than check. In a surprisingly short time — about twelve years — it was felt that the general public had become aware of the accountants' responsibility with respect to internal control and dropped the phrase from its certificate. Today it is implied and has become understood that the CPA, as an important part of his examination, has reviewed the system of internal control.

As the significance of the review of internal control as an auditing tool became recognized, the accounting profession gave long and serious consideration as to its scope and meaning. In October of 1958, after many years of study, the American Institute of Certified Public Accountants released its Statement on Auditing Procedures No. 29 which relates to the significance of the auditor's review of internal control as it pertains to his examination.

This statement is of importance, not only to those engaged in public accounting, but also to those who are involved in the design and supervision of the more complex and involved accounting systems.

Internal control, in the broad sense, is said to include both accounting and administrative controls. Accounting controls, as defined in the Statement, comprise the plan of organization and all methods and procedures that are concerned mainly with and relate directly to the safeguarding of assets and the reliability of the financial records. These controls relate to the system of authorization and approvals, separation of duties concerned with record-keeping and accounting reports from those concerned with operations or asset custody, physical control over assets, and internal auditing.

Administrative controls are defined as those which comprise the plan of organization and all methods and procedures that are concerned mainly with operational efficiency and adherence to managerial policies and usually relate only indirectly to the financial records.

The statement goes on to describe the responsibilities of the CPA with respect to the scope of his review of accounting controls and administrative controls.

Although this publication has recently focused attention on internal control, the CPA has used it as a part of his audit technique for some time. Its importance perhaps has become more widely recognized with the introduction of mechanized accounting and the birth of integrated data processing. IDP has been defined as the effective production of co-ordinated and uninterrupted flow of essential data needed by management in its decision-making, control and planning functions through the systematic organization of all related clerical routines. The CPA does not look upon integrated data processing, which has been made possible by mechanical and electronic equipment, as a development which will basically alter existing auditing techniques. Rather, because of the ability of the new equipment to furnish accurate, informative and timely information, the CPA will be able to eliminate most of the time-consuming tracing and footing of figures and concentrate his time more effectively on the interpretation of financial information.

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USITA Conventioners (l. to r.): HOWARD BERSTED and C. A. BROWNE, Chicago; C. A. BLAKENEY, Carlsbad, N. M., newly elected president of the Rocky Mountain Tel. Assoc.; and GENE FUEL, Raytown, Mo.

USITA 2nd Vice President, FRANK G. LAPRADE, Martinsville, Va.

USITA 3rd Vice President ELNATHAN C. GATES, Minneapolis, Minn.

Commercial Aspects of Automation

By E. H. UTZMAN*

Commercial Superintendent,
The Southwestern States Telephone Co.,
Brownwood, Texas

INDUSTRIAL technology, or "automation," has liquidated two romantic workers — the telegraph operator and the steam locomotive fireman. A diesel locomotive still carries a worker listed as "fireman," but his main purpose seems to be for emergencies in the engine cab, if the engineer drops dead at the throttle or something. The coal burning locomotive will soon be a museum piece. The diesel is more efficient than the old steam locomotive. It can pull as many cars as a drawbar will hold.

A generation ago the telegrapher was indispensable. Brokerage offices needed a telegraph operator to keep in touch with Wall Street. Newspaper offices had a Morse operator on duty to take the AP or the UP report. Trains' orders were conveyed from the division dispatcher's office by telegraph code. And, of course, the two big telegraph companies, Western Union and Postal, rested on a foundation of Morse men.

Telegraph operators handled a lot of confidential communications and walked through life with as many secrets as a priest, a lawyer or a doctor.

So it goes with the telephone industry today. In the United States there are approximately 66,000,000 telephones, more than half of the 117,800,000 in the world. Each day in the United States 245,000,000 conversations hum over the wires. There are more than 500 calls a year for every person. At any second of the business day more than 2,000,000 people are talking on phones in the United States alone.

As with the locomotive fireman and the Morse telegrapher, the telephone operator is feeling the effects of automation. Today approximately 94% of all the telephones in the United States are connected to dial systems. This is removing the need for local telephone operators.

Telephone people in talking shop today use terminology that was unheard of a few years ago. It is a sign of the times that shows the rapid advancements that are being made in our technology and service concepts. Commercial people will do well to be alert to such changes and their impact on public relations, sales, advertising, collections, directories, business office pro-

**Mr. Utzman presented this paper at the 1959 USITA Commercial Conference.*

cedures and many other activities in this field. Here are some examples.

2-5 Numbering

THE PHRASE "2-5 numbering" has become almost as well known with telephone customers as it is with telephone employes. This involves use of numbers for entire exchanges and requires great care and adequate explanation to our customers well in advance of the scheduled cutover date. Two years notice is not too long for large exchanges and one year should be a minimum. This gives customers time to change numbers on printed matter, signs, etc. so they will be ready when the change comes.

Mark Sensing & Machine Accounting

Mark sensing and machine accounting (data processing) require new billing methods, a new look for bills and toll statements for customers and sometimes a different procedure for payment. Here again public understanding and acceptance is a commercial job and an important one.

Microfilming of Toll Tickets

Microfilming of toll tickets now being done by many companies is a method that enables the company to furnish the customer with the toll ticket made by the operator at the time his call was made. This, too, has acquired much advance publication and subscriber education.

Direct Distance Dialing — A New Household Word

Direct Distance Dialing (DDD) is becoming almost a household word in many areas. Acceptance of this service by the public requires careful advance planning ahead of conversions and adequate customer instruction. Conversion of CDO exchanges and institution of DDD and other mechanical methods usually means that a community will experience the loss or reduction of telephone personnel.

This, also, is a delicate public relations problem and an important one. The trend is to move local operating and plant people to central points for greater efficiency, thus further reducing the telephone population in smaller exchanges. It then becomes an important responsibility of the company to maintain adequate contact with customers in these areas and see that the company is properly represented in community activities.

These are some of the responsibilities that concern us today. We, as an industry, are moving away from our customers. We must not overlook the importance of providing means whereby we can keep in touch with all of our customers. In our daily rush to convert our exchanges to non-attended dial operation we must not overlook the fact that ours is a service organization and service is all we have to sell.

To sell this service to satisfied customers we must keep

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Members of this USITA Convention group are (l to r): JOHN C. MANIACI, Elkhart, Ind.; GEORGE C. KANNEY, Elkhart, Ind.; and V. G. BRADFIELD, La Porte, Ind.

MIKE BURNS (left), Mesquite, Nev.; WILLARD WADE, Victorville, Calif., and GORDON J. KENT of the FCC, Washington, D. C.

USITA Directors W. G. WINTERS (left), Houston, Texas, and H. E. HAGEMAN, Lorain, Ohio. Mr. Winters presided at the REA Borrowers' Conference on October 11.

R. D. CARLYLE (left), Mattoon, Ill., visits with PAM D. GRINSTEAD, Kerrville, Texas, between USITA Convention sessions.

USITA Conventioners shown above are (l to r): E. C. EAGLEN, Battle Creek, Mich.; BETSY MEYERS, Chicago; JACK BENJAMIN, Cumberland, Wis.

Cable Pressurization Methods

By L. W. ROBELLO*

General Plant Manager,
Hawaiian Telephone Co.,
Honolulu, Hawaii

√ ***The Hawaiian Telephone Co. has applied the Continuous Feed Pressure System of Cable Protection to its plant on five major islands in the Hawaiian group. The company has equipped 29 of its 58 central offices with compressor-dryer units. In this report Mr. Robello tells how the job was done and describes the results.***

GREETINGS and Aloha from the Hawaiian Telephone Co. and the 50th State! Some of you may be wondering why a Hawaiian from a group of islands in the middle of the Pacific Ocean should be presenting a paper on a modern development such as pressurized telephone cables, but your curiosity may be satisfied when you learn that the Hawaiian Islands had telephones as far back as 1878.

In fact, we even had cowboys before they drove the first steer to market in Texas — but that's another story. Getting back to telephones, the year 1878 was only two years after Alexander Graham Bell invented the telephone; and unless I'm mistaken, quite a few of the states had not accepted the telephone as a medium of communication at that time.

On August 16, 1883, the Mutual Telephone Co. (changed to Hawaiian Telephone Co. in 1954) was founded in Honolulu under a charter from King Kalakaua, reigning monarch. As far as we know, we are the only telephone company under the American flag today to be founded under a royal grant.

Hawaii has the unique distinction of being the only state served in its entirety by *one* Independent telephone company. Back in 1910, Honolulu was one of the first major cities to install an automatic dial system. An interesting side light in connection with this first installation was that it permitted non-English speaking people to dial their numbers and was much simpler than trying to hire operators who could speak half a dozen languages. Today our entire system is 100% dial-operated.

From a humble beginning of 100 subscribers the Hawaiian Telephone Co. has grown to serve nearly 200,000 telephones on the islands of Hawaii, Maui, Oahu, Kauai, Molokai, and Lanai.

The history of cable protection in the Hawaiian Telephone Company dates back to a year before the Pearl Harbor attack in 1941. We had initiated a system of cable protection for all toll and interoffice trunk cables by introducing dry nitrogen under pressure into such cables. Under this system, cables were first made gastight before nitrogen was applied. By the end of World War II all our toll and interoffice trunk cables were protected.

Although the static system did provide good cable pro-

*Mr. Robello presented this paper at USITA's 1959 *Plant Conference.*

tection, its use was limited to toll and interoffice trunk cables on the island of Oahu because of its high cost. The exchange cables, which make up the greater percentage of any cable plant, were left unprotected and, therefore, were vulnerable to heavy tropical rainstorms.

To illustrate this point, during a severe storm on November 28, 1954, more than nine inches of rain drenched the island of Oahu in a 25-hour period. That storm was a real disaster. As the storm progressed, cable trouble reports started rolling in. Our testdeskmen could not locate the troubles as fast as they were reported. Cable repair crews were dispatched to trouble spots, but the trouble cases occurred faster than they could be repaired. Additional cable repair crews were flown in from the neighbor islands. Repair crews worked around the clock. After six hectic days, service was almost back to normal. The records indicated 253 cases of cable trouble, with about 10,000 subscriber trouble reports. The estimated cost of repairing the storm damage was in excess of $60,000.

A study of the statistics of this storm showed that 61% of all cable troubles resulted from sheath cracks, most of which had occurred months earlier but did not show up until the heavy rain. Then, we got all of our trouble at once. We asked ourselves what could be done to prevent another such disaster. We heard that some companies were experimenting with what was called the "Continuous Feed Pressure System of Cable Protection," (or "Continuous Flow System") and this appeared to be the best answer to our problem. I would be remiss at this point if I failed to acknowledge the invaluable assistance given us by the Pacific Telephone & Telegraph Co. in getting our program under way.

The Continuous Feed Pressure System Program

IN 1955 we launched our own Continuous Feed Pressure System program. The theory of such a system is simple. After plugging the cables in the vault, dry air under 10 pounds pressure per square inch was pumped into the sheaths of all trunk and distribution cables leaving our Main Central Office.

It was assumed that the air would flow freely through these cables to neighboring central offices, and from these offices it would be further distributed to other trunk and distribution cables.

When the air reached the end of a cable, it was believed that a pressure of 2 pounds per square inch could be maintained if the larger holes, or "pukas" as we refer to them in Hawaii, in the cable could be closed. This positive internal pressure would prevent moisture from entering the cable through minute "pukas" or breaks in the cable sheath.

In theory everything looked fine. We purchased a compressor-dehydrator capable of delivering continuously 200 cubic feet of air per day. We believed that if the air leakage could be limited to about two cubic feet per sheath mile per day, this compressor-dehydrator would easily protect 100 sheath miles of cable. The unit was

TE&M's Advertising Manager DONALD SORENSEN (left) meets STAN WILSON, Anaheim, Calif., at recent USITA Convention.

installed in our Main Central Office in down own Honolulu and was connected to trunk cables running to a central office located about 2½ miles away. At that point the trunk cable sheaths were connected through a manifold to the exchange distribution cables leaving that office.

A Plan Falls Apart

WHEN THE compressor-dehydrator in the Main Office was "fired up," our beautiful plan began to fall apart! First of all, we found that cables do not make very good "gas mains." The resistance to the flow of air from one end of our trunk cable to the other end was too high to permit much air to reach the second office, and we learned the hard way that paraffined splices restrict the flow of air and have to be by-passed. So, it turned out that one compressor-dryer could supply only the cables to which it was directly connected, thus precluding the pumping of air to adjacent offices.

The second flaw in our theoretical approach appeared when we found that too many man-hours of work were required to reduce air leakage. Our efforts to reach the original consumption objective of two cubic feet per sheath mile per day were time-consuming and expensive, and we could visualize long delays in obtaining complete protection for our cable plant.

A Compressor-Dryer Unit

IN ORDER TO overcome these difficulties, we decided to capitalize on our experience and try a new concept. To get the maximum protection in the shortest possible

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USITA Conventioners (l. to r.): JIM McHENRY, Jefferson City, Mo.; MRS. LYLE CROSS, Beaverton, Ore.; MRS. D. A. PERIGO, Everett, Wash.; H. A. CUNNINGHAM, Albany, N. Y.; and KATHARINE BAUER, Jefferson City, Mo.

Planned Development

For Profitable Management

By F. W. HAMPER*

**Operating Vice President,
General Telephone Co. of Ohio,
Marion, Ohio**

√ The telephone industry must move steadily and persistently ahead with a solid plan for the development of future managers. The requirements that must be met are "rather overwhelming but not impossible" to meet.

DO WE NEED a plan for development of management? Is it necessary to constantly harp on this so-called problem area of training? What's wrong with the way we've always operated? We've come this far, why change now?

These are some of the questions that enter our minds from time to time when this strange, new and involved, sometimes complicated, problem of developing management confronts us. No need to turn your back or ignore it, because it just won't go away. It's always been with us and it's here to stay. SO — let's face it!

Certainly we need a plan for development. Little if anything is accomplished for very long without some definite plan of action — formal or informal. It is necessary also to have this problem constantly before us and to make every effort to overcome the known difficulties and to remain alert for those that haven't been revealed as yet.

There are many things wrong with the way we have always treated this problem of development. If we have been successful in having individuals ready for promotion, many times it has been purely accidental. If we have had a satisfactory and profitable operation with our present and past methods — how much more profitable might it not have been with improved and better techniques.

It has been said many times by many business leaders, much more experienced and qualified than I, that if we are not moving forward we are going backward. It is not enough to just stand still — to do so is to gradually slip and finally lose ground. The competition of other business for potential management is also becoming ever greater — and must be met head-on. Certainly the telephone industry should not be content to take "leftovers" from the employment offices and other industries. Nor do we want to have only "warmed over" management that has been discarded by other industries.

There is another highly pertinent reason why we must face this problem and successfully overcome it — the challenge of progress for the future! Our industry is making tremendous strides in the laboratories, on the manufacturing production line and more recently in the sales field. Are we really prepared to maintain the pace we have set for ourselves and our successors? I think not. At least not to the extent that will be needed ultimately. Here again there is indicated one more good reason for an active well-defined plan for development.

With our 20-20 hindsight we can now see that to some extent we have been blind and have not seen

*Mr. Hamper presented this paper at USITA's 1959 Traffic Conference.

clearly the areas where concentration and alteration would be needed. Also there has been a tendency to underrate the pressing requirement for more and better management. You can remember clearly, I am sure, when the main (and sometimes only) prerequisite for a line foreman was that he be big enough and experienced enough to get the construction program completed. Or that the important qualification for a chief operator was to get along with the girls and watch their answering time. We are expecting and demanding more from the management employe today and without doubt will require even more in the future.

It is not enough that he be merely a leader or a supervisor — he must also be a manager in every sense of the word. This means he must have the ability to think and to put such thoughts into immediate action. He must then delegate that portion of his own responsibility that can be done best by his subordinates and then follow up diligently to see that it is done. In this respect, it becomes imperative that he understand such delegation does not in any way relieve him of his own accountability for satisfactory results.

Beside all this, our managers must be capable of analyzing each individual, situation and circumstance to determine what further action must be taken to correct any deficiencies in either work operation or personnel performing the work. This then requires him to be a good instructor and a capable planner.

Since he is accountable for results from his portion of the over-all operation, then he of necessity must understand and comprehend the complications of the effect of his actions on the cost and expense of doing business. He must know how to control his functions so that the area for which he is responsible will not exceed the budget that has been developed. This budget is also a plan that he had some part, directly or indirectly, in compiling.

In keeping with his analysis of each of his subordinates, he must get to know them well enough to see that they each get what they need to develop and grow in the organization. Summed up briefly — good management is the intelligent planning of an objective and the successful execution of that plan. This plan must have both short and long range objectives and the execution of it must produce a mutual satisfaction to the employes, the shareowners, and the customers. Nothing short of this will do!

Management Development

NOW PERHAPS it is easier to see why we can not be satisfied with past success (if any), but must move steadily and persistently forward with a solid plan for development for present and future managers. The requirements that must be met are rather overwhelming but not impossible. We can solve this problem just as we have many others in the telephone industry. Once we have determined the size of the elephant the only thing that remains is to pick out a spot to take the first bite.

USITA Secretary GEORGE RICHERT (left) and USITA Directors R. A. LUMPKIN, Mattoon, Ill., and CLIVE W. HAAS, Big Timber, Mont.

Mr. and Mrs HOWARD B. FINE, Rison, Ark., attended the recent USITA Convention.

Having recognized some of the facets of this difficult situation we must take immediate and decisive corrective action. It becomes a matter of developing a plan for maintaining a quality control over the organization. This does not mean merely setting up some kind of "program" with all kinds of magic gimmicks that are suppose to hypnotize everyone into a state of lethargy so that this problem can be easily solved while everyone is anesthetized.

It does, however, indicate a real need to create and maintain an attitude throughout the ranks and levels of management that recognizes and accepts the responsibility to stimulate and build men. Each manager must be constantly aware of the need for proper selection, placement, coaching and communication in connection with new and promotable employes. There must be an awareness and willing acceptance of this responsibility.

This is not a new or added function that must be performed. It is just one that has been somewhat overlooked and must now be emphasized to a greater degree. As a business becomes larger, the viewpoint of all management must broaden proportionately. Development of management must therefore encompass more involved and elaborate plans than it did when the business was smaller.

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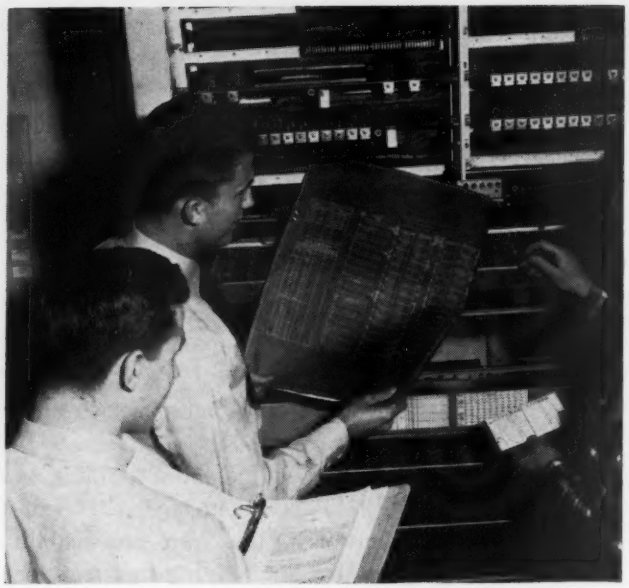


Customer Relations

And the Traffic Department

By WILSON B. GARNETT*

Division Manager,
Central Telephone Co.,
Hickory, N. C.

√ ***Despite automation, the Traffic Department's part in Customer Relations is not diminishing. If anything, Traffic's role presents greater challenges and opportunities than ever before.***

CUSTOMER Relations has been described as an intangible thing — an effect — a result. The effect is the impression which the customer group has of a company, its product or its service. The result is the degree of customer understanding and acceptance of the company, its product, its service, its objectives, its plans and its problems. Certainly, the telephone industry as a regulated utility has as great a need for public understanding, acceptance, and support as any industry or business.

The very foundation of Customer Relations is the quality of our service. Unless our customers are satisfied with the service we offer all other efforts to develop good Customer Relations will, for the most part, be wasted effort. Not only must we provide good service to our customers today, but we must prepare for meeting their needs and demands in the future.

We are living in a world and society which is constantly changing, moving, and progressing. We must be ever cognizant of the changing nature of the customers' needs and be prepared to meet them. Unless we do, someone else will; and, the telephone industry will go the way of the horse and buggy. We must think progressively, always searching for new and better ways to serve our customers. Yes, this is a part of good service.

"Impressions"

THE CUSTOMER'S impression of a company results from many things — its service, its buildings, its equipment; but, perhaps the most important and lasting impression is made by the personnel of a company. Each employe contributes to this impression through his enthusiasm, his ability to do his job, and his attitude toward the customer, his job and the company. An employe's enthusiasm and attitude will not be any better than his knowledge of the company.

Too frequently, I think, we fail to give our people sufficient information about the company, its problems and its objectives. We must make them a member of the team by proper orientation, and by keeping them fully and constantly aware of what is going on.

It is imperative that we train our employes well, that each employe have a sincere and conscientious appreciation for the importance of his job, and that he takes pride in doing it well. One poorly trained employe with a poor attitude and lack of enthusiasm can do more harm to Customer Relations than can be overcome by

*Mr. Garnett presented this paper at USITA's 1959 *Traffic Conference.*

ten properly trained, enthusiastic employes with a wholesome attitude.

Customer and public understanding is essential to good Customer Relations. Understanding is the result of being informed. We must keep our customers informed about the company, about the work we are doing, about the progress we are making, about our plans for the future, and about our problems.

We are a most important part of every community we serve. Our growth and progress is of great interest to our customers. Tell them about it through timely news releases, through community activities, and by use of advertising media. Talks before Civic Clubs and periodic open houses are always helpful. Individual contacts between customers and well-informed enthusiastic employes on both business and social occasions offer excellent opportunities to develop a better understanding and acceptance of our problems, plans and objectives.

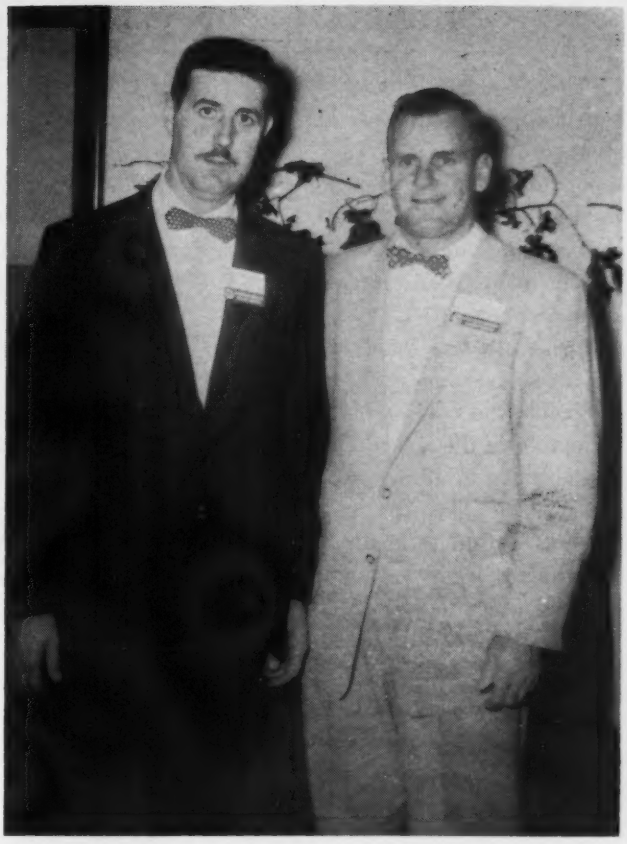
Traffic Plays Vital Role

THE TRAFFIC Department plays a vital role in every telephone company's Customer Relations effort. Now I don't propose to try to tell you how to play this role — that is for the experts. But, I would like to outline it as I see it.

First and foremost, Traffic must fulfill its responsibilities of doing a good service job. This involves such things as employing, training and developing the Traffic force, providing adequate switchboard positions, long distance circuits and local trunking to furnish good, dependable and acceptable service. It requires proper force assignment to meet the fluctuations in Traffic, the development of service objectives, together with methods of constantly and continuously measuring the level and quality of service. Corrective methods must be planned and immediately available if the level or quality of service falls below established objectives.

There are more contacts between customers and members of the Traffic Department than any other. Each of these contacts is an important opportunity to influence Customer Relations. Many heroic episodes are recorded of the switchboard operator who remained at her position in the face of personal danger, of the operator whose efforts above and beyond the call of duty saved a life. These truly represent the spirit of service of our industry, and the public reaction is good; but, we cannot depend upon these for good Customer Relations. We must find ways to impress the customer with our genuine desire to serve him in the everyday routine contacts.

I was impressed by an article which appeared in a recent issue of *Telephone Engineer and Management* entitled "What Do Newsmen Think of Your Company?" The author, a newspaper man, interviewed a number of his colleagues in order to answer this question for us. One editor made the following statement, "Yes, the phone company here has courteous employes but sometimes they place courtesy above efficiency. The tradition of being polite under all conditions is fine but I would prefer a sacrifice of courtesy if necessary to get more efficiency."



E. E. MALLAR (left) newly appointed exchange manager at Camden, Mich., and RICHARD ROBILLARD, Camden equipment man, attended recent USITA Convention.

This, I think, shows that phraseology alone will not impress our customers; but even so, I wonder if some improvement cannot be made in this area. One West Coast company reports excellent customer reaction to the answering phrase of "May we help you?" in place of the conventional answer of "Operator." A New England company is experimenting with the phrase "Your call please."

"Greater Opportunities"

WITH MORE and more automation in our industry, and particularly direct distance dialing, the frequency of operator contacts with customers is diminishing. However, this does not mean that the Traffic Department's role in Customer Relations is diminishing. If anything, it presents greater challenges and opportunities for Traffic people.

With DDD, customer education and training becomes increasingly more important. Many millions of dollars have been and are being invested in toll switching equipment and trunks. With operator toll dialing it was relatively easy to train operators to use these facilities properly and in the most efficient manner.

With DDD we are turning the customer loose, so to speak, on the toll network. In order to obtain the greatest degree of efficiency from these expensive facilities and at the same time assure good service, our customer education programs must be designed to accomplish the desired results, and expanded to cover all telephone users.

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"Report From Washington"

(Continued from page 49)

tion has advocated expansion of the coverage of the law, it has expressed opposition to an increase in the minimum wage, at least to the $1.25 level.

According to the best calculation we can make, there are about 2,900 manually operated telephone exchanges with less than 750 stations. It is these exchanges that are eligible to receive the benefit of the present exemption in the law. Figures are not available as to how many of them are so-called agency exchanges, so we have no way of estimating the number affected by the proposal to limit the exemption to operators who operate switchboards in their own homes.

But with respect to the $750,000 annual gross revenue limitation in the Kennedy bill, there are 116 Independent companies grossing more than this amount. Of these, 56 have a total of 467 manually operated exchanges with less than 750 stations each. It is these 56 companies which would be deprived of the operator exemption altogether.

Another year, however, has gone by and no legislation increasing the minimum wage or tampering with exemptions has been enacted. Our Association has stood guard over our exemption and other trade groups have guarded theirs. With the political situation what it is, with all the labor unions seeking legislation, with presidential aspirants leading the parade, it may be expected that a more vigorous attempt than ever will be made in 1960, a presidential election year, to bring legislation to fruition.

In the days intervening before Congress reconvenes in January, Independent companies that would be adversely affected by an increase in the minimum wage and by any adverse adjustment in the switchboard operator exemption should contact the members of their Congressional delegations and make their views clearly known.

(c) Bills to Increase the Securities Exemption

Despite the recommendations of the President's cabinet and the Securities and Exchange Commission and the support of our Association, investment groups and the New York stock exchanges, Congress has not yet acted favorably on bills to increase the exemption under the Securities Act. At two different times in the past we have succeeded in getting the Senate to approve an increase to $500,000 from the present $300,000 exemption, but both times the House of Representatives has failed to act. Speaker Sam Rayburn, author of the Securities Act, has led the battle against us.

We shall continue to advocate the desired legislation and hope that the sunlight of reality may yet shine on our opponents. At hearings held last summer before a Subcommittee of the Senate Banking and Currency Committee and a Subcommittee of the House Interstate and Foreign Commerce Committee, our Association again presented testimony in support of pending bills.

At the hearings we stated that inflationary considerations were justification for increasing the exemption to $1 million. At the same time we expressed opposition to entirely new provisions of the bills which would materially tighten civil liability provisions, on the ground that the public interest is adequately protected so far as telephone companies are concerned through public service commission regulation.

An increase in the exemption would facilitate and make less expensive the clearance through the S-E-C of issues of securities of our smaller companies. An increase is long overdue especially in the light of the impact of inflation.

(d) Labor Reform Legislation

Legislation to bring about a correction of many of the labor abuses uncovered by the McClellan Labor Rackets Committee was finally enacted after much maneuvering and jockeying. The Senate earlier in the session had passed the Kennedy-Ervin bill, S. 1555. By Senator Goldwater (R.-Ariz.) it was likened to a flea bite on a bull elephant and as something falling far below the minimum expected by the American people.

Senator McClellan said it was full of empty gestures and pleasant platitudes. Even the liberal *Washington Post* said it was a "boy sent out to do a man's job."

After hearings by the House Labor Committee, another bill, H. R. 8342, was finally reported, a measure a little stronger than the Senate bill but still weak in many of its provisions. Then Congressman Landrum (D.-Ga.) and Congressman Griffin (R.-Mich.) jointly introduced H. R. 8400, a bill more realistic in its attempt to deal with labor abuses. The House passed the latter bill. A conference committee then tackled the job of working out a compromise. In the meantime President Eisenhower made a television appeal to the American people to back satisfactory legislation.

Conference committee meetings resulted in a compromise closer to the Landrum-Griffin bill, and a report by the committee was then accepted by both the Senate and the House. The President signed the bill into law on September 14.

As finally enacted, this labor reform legislation among other things enlarges the jurisdiction of the National Labor Relations Board in certain respects, deals with the subject of hot cargo, comes to grips with secondary boycotts and organizational picketing, carries provisions to protect the rights of the laboring man by introducing democracy in labor unions, and requires union financial reports.

Thus another chapter has been written into the law relating to the labor union movement in the United States. It is another indication of public reaction to evils which seemingly have a way of developing as part of the American economy marches up the road to maturity.

One provision of the Kennedy-Ervin bill as it passed the Senate was of direct interest to telephone companies. The provision would have diluted the definition of "supervisor" as used in the Taft-Hartley Act by

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NOMINAL WEIGHTS OF FINISHED WEATHER-RESISTANT WIRE AND CABLE

(Pounds per 1000 Feet)

Conductor Size AWG or Mcm	Copper & Copper Alloy Conductors: URC Type Double Braid	URC Type Triple Braid	Neoprene Type	Polyethylene Type	Aluminum Conductors: Neoprene Type	Polyetnylene Type
Stranded						
2	246	270	248	**230**	105	**87.4**
4	155	170	163	**143**	73.3	**53.3**
6	103	115	108	**91.5**	51.5	**35.0**
Solid						
2	239	260	232	**219**	92.2	**79.2**
4	151	164	152	**136**	64.0	**48.0**
6	100	112	101	**87**	45.7	**31.7**

Sources: American Standards Association Specifications

This table shows

POLYETHYLENE covered line wire weighs less

Because it's the lightest, polyethylene-covered line wire is the easiest for linemen to string up . . . hardest for ice and snow loading, gale-force winds to bring down.

Polyethylene-covered line wire, depending on size and conductor, weighs from 5% to 32% less than other types. That's what the figures in the specifications tabulated above show.

This, of course, is no news to linemen who have strung all types of weatherproof line wire. They may not be able to quote pounds and percentages, but they all know you can't beat polyethylene on weight.

Linemen's Favorite Material

Light weight means easy handling, one of the main reasons polyethylene rates tops with installation crews. They also like polyethylene wire because it's clean . . . free-stripping . . . has a smooth, self-lubricating surface that almost makes pulling a pleasure. And despite the exterior slip, the plastic covering hugs the conductor tightly, doesn't ruffle as it goes over crossarms.

"Built-in" Safety Factor

Polyethylene's lightness provides lasting mechanical advantages, since span loads don't tax supports as much as heavier type wire. This "built-in" weight safety factor pays off when violent storms push aerial construction to strain limits . . . when ice and snow loads topple heavier lines.

An added factor in polyethylene wire's ability to stay up under adverse conditions is its smaller diameter. It offers less resistance to wind, a smaller surface for ice build-up.

Winning Combination

Called the "closest to the ideal covering for line wire," polyethylene is outstanding in other respects too. The shield it forms over wire is continuous . . . tough . . . resistant to aging, weathering, moisture, abrasion by lashing branches. It's good for decades of superior service marked by fewer outages, minimum maintenance.

When you order covered wire and cable, make sure the coating is made with PETROTHENE® polyethylene resins. PETROTHENE polyethylene costs no more, but it gives you premium weather and stress-crack resistance.

Polyethylene's advantages are outlined in an informative new U.S.I. data sheet, "Polyethylene . . . The Best Line Wire Covering." Also available is a data sheet showing properties, applications and specifications of PETROTHENE polyethylene compounds. Send for your copies today.

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- SAMPLE PROPOSAL
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AUTOMATIC ELECTRIC SALES CORPORATION
ATTENTION: J. M. Zidlicky, Director of Sales Promotion
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Gentlemen:
Please send me a copy of your new 1960 P-A-B-X Sales Kit.

MY NAME IS_____
PLEASE PRINT CLEARLY

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specifying that service assistants in the telephone industry shall not be considered in that employment category. We are glad to state that when a bill was reported by the House Committee it carried no such provision. And as finally enacted, the labor reform legislation above mentioned left undisturbed the definition of supervisor as it has appeared on the statute books.

(e) Penalties for Malicious Damage to Communication Facilities

A bill, H. R. 8138, providing penalties for malicious damage to communication facilities, was introduced on July 8 by Congressman John Dowdy (D.-Tex.). A highly meritorious measure, it is simple and brief and was referred to the House Judiciary Committee for attention. I have advised the committee of our interest and asked to be notified whenever hearings are held. The bill provides:

> "That section 1362 of title 18 of the United States Code is amended by adding after the words 'operated or controlled by the United States,' the words 'or used or useful to the military or civilian defense functions of the United States'."

The United States Code already makes it a criminal offence willfully or maliciously to injure or destroy communication facilities operated or controlled by the United States. But no specific federal protection is given to commercial facilities.

The Department of Defense in a report on the Dowdy bill has expressed the opinion that the disruption by willful or malicious cause of any commercial communication system "could gravely endanger the national existence." The Department feels that the enactment of such legislation "would establish a deterrent which would do much to protect the integrity of commercial communication systems utilized by the military."

We hope the Judiciary Committee will act on the bill at an early date.

(f) Bills Relating to the R-E-A

In President Eisenhower's budget message to Congress last January he recommended encouragement of "private lending through flexible interest rates for government credit programs." He stated that in a number of important cases present legislation sets "inflexible and uneconomic restriction on interest rates" creating unintended and hidden subsidies and requiring excessive use of federal funds by discouraging private lending."

Specifically referring to R-E-A loans, he said: "The present statutory interest rate of 2 percent for loans made by the Rural Electrification Administration (should) be replaced by a rate which will cover the current cost to the Treasury of equivalent-term borrowing and other reasonable costs."

The last session of Congress witnessed the introduction of a dozen or more bills in both the Senate and House relating to the R-E-A, but none reached the committee hearing stage. Without listing the bills it may be of interest to note that they took various forms including the following:

(i) To require interest rates to be fixed by the Secretary of the Treasury after taking into consideration current average market yields on government obligations plus an amount to cover administrative expenses and probable losses.

(ii) To establish the R-E-A as an independent agency of the executive branch of government.

(iii) To make the R-E-A Administrator independent of the Secretary of Agriculture.

(iv) To create a Rural Electrification Administration Revolving Fund in the U. S. Treasury, the purpose of which would be to assist the annual budget estimates of the R-E-A on a net expenditure basis. The fund would receive all assets, liabilities and net investments of the government agency. Notes outstanding to the Secretary of the Treasury would become liabilities of the fund. Then the balances in the fund would be available for loans, administrative expenses and repayments on notes to the Treasury. Obligations could only be incurred within the limits of annual appropriation acts of Congress. Principal and interest payments on loans would not go directly to the Treasury but remain in the fund and be available for future loans. Net appropriations in any year to sustain a given loan program could be smaller than at present because Congress would appropriate only the difference between loans made and collections expected.

Early in the session a bill was passed by both branches of Congress to divest the Secretary of Agriculture of jurisdiction to review loans over $500,000. The President vetoed this measure and his veto was sustained by Congressional vote. Hence the Secretary continues to exercise his former power.

More than a year ago our Board of Directors created an R-E-A Borrowers Committee within the U-S-I-T-A framework to give special attention to the problems of such borrowers. A report from it will be presented at the general R-E-A- Borrowers Conference on October 11, to be held as a part of this our 62nd annual convention.

The R-E-A on August 1 had a total of 673 telephone borrowers, of which 210 were cooperatives and 463 commercial companies. It has lent a total of $585,212,415, of which $229,791,232 was to cooperatives and $355,421,183 to commercial companies. Of the 665 borrowers 204 are members of the U-S-I-T-A — *Clyde S. Bailey.*

EDITOR'S NOTE

The regular TE&M Departments will be in their usual places in the November 15th issue. Check that issue for articles by C. D. Ehinger, D. A. Perigo, Dr. G. M. Jones, John Reed, Leo Sands, Allan R. Stacey, Roland Davies and Fred Henck.

"Customer Relations and Traffic"

(Concluded from page 67)

We must use every available training media such as educational programs in schools, talks to Civic and business groups, timely and well-prepared news articles, clear and understandable directory instructions.

DDD places greater responsibilities on Dial Service Assistance operators. Their importance will increase as more and more DDD installations are made. We must find better and more efficient methods of assisting customers in dialing their own calls rather than placing calls with the operator. Assistance calls can serve as a good measurement of the effectiveness of customer training efforts, and can provide a valuable basis for improving training programs, and for subsequent customer education work.

PBX Customers

PERHAPS one of the most important Customer Relations activities of the Traffic Department is that of dealing with PBX customers. Their number increases monthly, and indications are that more and more of our business users will be PBX customers in the future. They are also the largest toll users, and our responsibilities to them must be met.

What are some of these responsibilities? We must determine the customer's equipment requirements, assist in employment and training of attendants, instruct and train extension users, and provide continuous supervision of the service.

This work can best be accomplished through a PBX Service Adviser or similar position. The work of a PBX Service Adviser ranges from that of an ambassador of good will, to instructor, to personnel expert, and even to an equipment expert. She must not only work with the PBX attendant, but with the extension users and the customer's management personnel.

With the expansion of DDD the requirement for and the importance of the PBX Service Adviser increases. Her work can mean improved Customer Relations as well as important monetary savings to her company and the customer. By all means, Traffic should provide supervision and assistance to PBX customers. Select the person for this work with the greatest of care, train her well, for she could be one of the most important persons in the Traffic Department.

Traffic is responsible for keeping management advised of many things which can have a direct bearing on Customer Relations — when a customer needs more trunks, as to additional listings, and others. Traffic should maintain continuous analyses of toll routes, particularly those where extended area service is a possibility.

When toll calling between nearby exchanges reaches a point that a definite community of interest is evident, management should be advised. My experience has been that customers like extended area service when it is in the interest of the majority of the subscriber group. Why then shouldn't we carry the ball where EAS is practical and economically feasible rather than waiting for our customers to demand it?

In many companies there are more employes in the Traffic Department than in any other. Certainly then, Traffic employes are, or should be, an important part of the over-all Customer Relations effort. Outside of the office these employes, through their social and other activities, can be builders of good Customer Relations. The picture of the company which Traffic employes paint for their friends and acquaintances leaves an impression and that impression is either good or bad, but it is Customer Relations.

Traffic management has an obligation to select, train and develop employes who will be an asset to the company's program. To do this, Traffic management has the responsibility of keeping Traffic personnel fully informed of the company's objectives, of the work which is being done, and of future plans. This responsibility includes keeping employes abreast with new developments in the industry and of the progress of the company toward meeting its objectives.

Yes, the Traffic Department can and should play a major role in Customer Relations. No company's efforts can be fully effective without Traffic's contribution. To this end, Traffic has an obligation and responsibility to provide continuously improving service, to train and educate customers in the use of the service, to provide special supervision and assistance to PBX customers, to keep management informed of new and extended services which can be offered on a profitable basis, and to develop proper Customer Relation attitudes within the Traffic force both on and off the job. — *Wilson B. Garnett.*

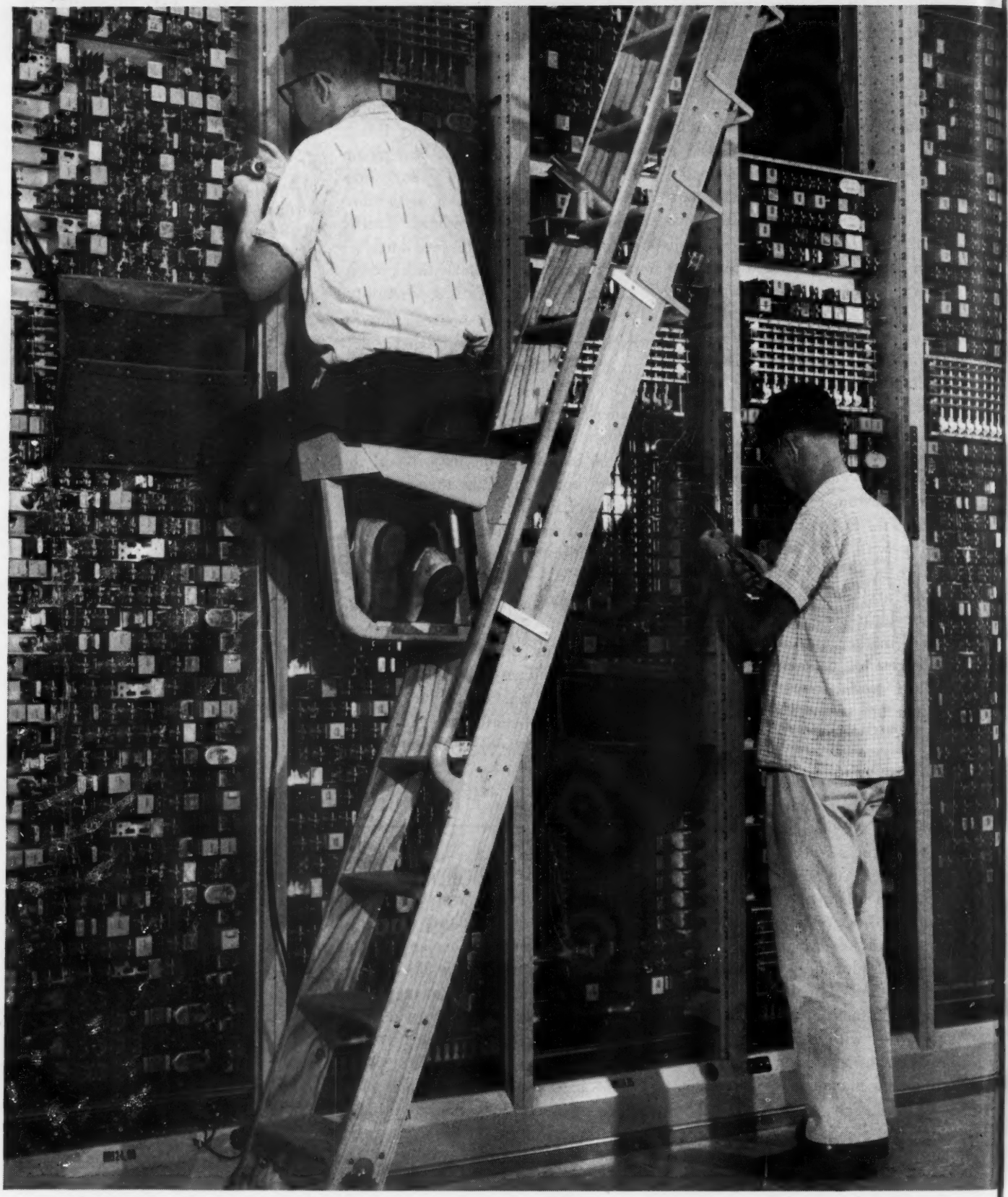
"Planned Development"

(Continued from page 65)

More is expected of lower levels of management because certain responsibilities for making decisions must be delegated farther and farther down and closer to the point of action. As this broadening of management viewpoint is spread more and more throughout the organization the need for greater personal and self-development becomes apparent. Each manager must carefully analyze himself from time to time and determine what shortcomings he has, thereby laying the ground work for future self-development. We must then expose him to the opportunities for improvement, thereby permitting him to take advantage of this and to develop.

In my opinion, a distinction should be made between supervisory training and management development. Supervisory training implies to me the teaching of certain techniques that are necessary to effectively supervise the work of others. It is not necessarily an all inclusive type of training but rather limits itself to the more basic fundamentals of getting a job done through others. On the other hand, management development is broader in scope and tends to be all inclusive. It deals more directly with the cause and effect of the inter-relationship in

Please turn to page 76



DIAL SERVICE ON THE WAY. The Western Electric installers above are wiring a bay of dial switching equipment in a new Bell telephone office in Vincennes, Ind. By mid-December, the 18,000 citizens of this historic community on the Wabash River will be using one of the most modern telephone systems in the country – dialing directly both local and long distance calls. The complex equipment was made by Western Electric and is being assembled, wired and completely tested by skilled W.E. installers.

A TALE OF 6,700 CITIES

Last year skilled Western Electric installation teams helped provide more and better Bell telephone service for 6,700 U. S. cities and towns . . . perhaps yours.

The pictures on these pages show a team of Western Electric installers helping a Bell telephone company bring dial telephone service to its customers. In this case the town is Vincennes, Indiana – but it could have been your town.

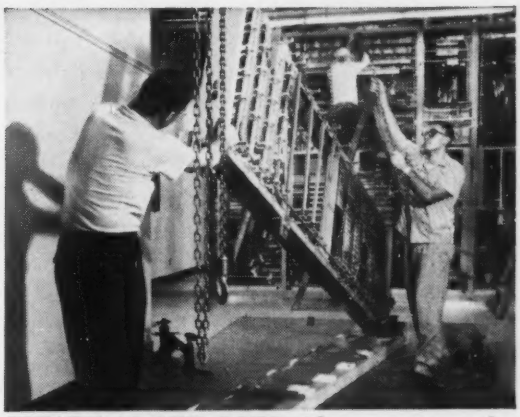
Like most Western Electric installation projects these days, the Vincennes job is a step toward dial telephone service for everyone served by the Bell System. Right now some 94% of all Bell customers have dial service. Many of them, as will the people of Vincennes, enjoy the added convenience of Direct Distance Dialing – dialing their own long distance calls quickly and accurately.

Working out of 123 key cities, our 16,000-man installation force installs the intricate Western Electric equipment which makes modern telephony possible. Their skill and craftsmanship contribute greatly to our goal of ever improving Bell telephone service.

Beside its installation activities, Western Electric Company has manufacturing plants in 25 cities where we make telephone equipment for the Bell System. Last year we purchased over a billion dollars worth of raw materials, products and services from more than 30,000 suppliers located in every state of the Union. Of these, 90% are "small businesses." The things we make and buy are distributed to the Bell telephone companies through Western Electric distribution centers in 32 different cities.

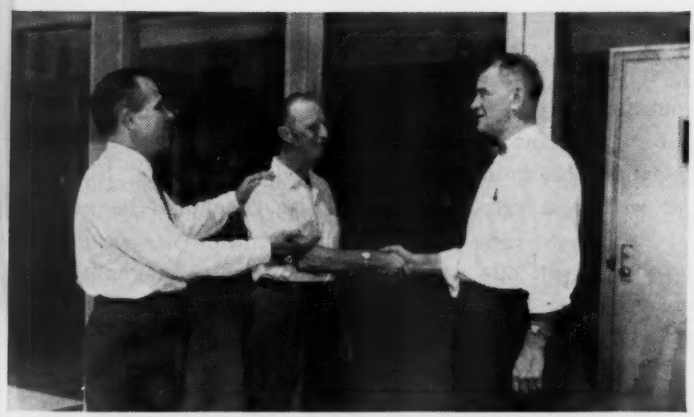
Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM



STEADY AS SHE GOES. After uncrating, the intricate frames of switching equipment are hoisted upright and placed in position. One hundred ninety such frames are being installed in Vincennes, bringing dial service to over 7,000 telephone customers.

VINCENNES LUMBER DEALER, Jack Klemeyer (right), discusses the new central office with Western Electric's job supervisor Russ Bandy. The Vincennes business community is looking forward to the completion of the new office – improved telephone service is always a help to the businessman.



"MEET THE MAYOR." During an informal sidewalk conference, Chuck Rollins (left), manager of the Indiana Bell Telephone Company office in Vincennes, introduces Mayor Lloyd ("Red") Wampler (center) to Western Electric area supervisor F. E. Oliver. Mayor Wampler says, "We are certainly glad to have a dial central office installed in Vincennes. Improved telephone service is vital to our town's prosperity."

NEWSMAN'S OPINION. Howard N. Greenlee, General Manager of the *Vincennes Sun-Commercial* and radio station WAOV has a sharp eye for his town's future. He said, "These Western Electric men are a fine crew, and they're bringing Vincennes better telephone service for a better tomorrow."

the organization. It recognizes more specifically the trite but true statement that no management can expect to be successful as a "one man show." It takes into consideration the need for a broader range of knowledge and understanding of the over-all management functions — a broader breadth of viewpoint, if you will.

This certainly implies that each manager must realize that his actions cannot be independent of others, but, concerted with others, go to make up the complete effort for successful and profitable operations. Here again with emphasis on the need for each supervisor to become more of a manager accepting not only the responsibility but also the accountability for satisfactory results. This then is the climate in which a plan for development can thrive and grow and produce the benefits that are needed for a prosperous future.

Much has been written and spoken about the ingredients that should go into a management development program. As I have indicated before, in my opinion, it definitely should not be tagged with the misnomer "program." I think it should be a plan of action — one that is based on short range objectives as well as long range.

It should be flexible enough so that it can be bent to fit the idiosyncrasies of the "organization personality," yet stiff enough to avoid the shortcomings of the personalities in that organization. It must satisfy the development needs of the organization as a whole, and at the same time meet the individual management requirements to fill holes in the organization. It must be compatible with, and be a part of, each level of management's over-all objective for improved and profitable operation.

How can all this be done? What do you do to accomplish everything that I have indicated is needed? I don't know — not exactly anyway. Furthermore, I am becoming more and more convinced that even the "experts" are confused and perhaps aren't too certain of the exact formula for answering this intriguing problem.

I would like to suggest, however, that a somewhat simple, but practical, approach be taken at this point. It would seem that the first step would be to check with those "experts" who have studied this matter in more detail and perhaps with greater diligence and some success.

I am certain that you will find many suggestions and ideas on this controversial matter. Careful analysis of this whole problem, however, will show you that except for the unpredictable human element, this isn't much different than many of the situations encountered in day-to-day operation — just broader in scope and effect. Many experts have expressed it in more technical terms but it generally boils down to this:

(1) You determine what kind of talent you have in your present organization, get a general idea of who has what abilities and what function each is presently performing, then what functions you may want performed in the future.

(2) You decide what kind of managers you have now by simply measuring what they are presently capable of and subtracting that from what you feel you require now and in the future; the result will be the development or training needs, as the case may be, of each manager and the requirement for additional management talent.

(3) You then figure out a plan to give to each manager whatever is necessary to make up his deficiency and at the same time follow a course of action that will supplement the organization with adequately developed and trained management for the future.

Job Descriptions

ONE OF THE first things necessary to follow out this plan is an organization chart or some means of showing your organization plan both on a short range as well as a long range basis.

It also becomes obvious at this point that you cannot determine what is lacking in your management unless you know what you require. Therefore a well-defined and understood description or standard for each job is needed. Then each incumbent can be measured against that standard — both of his present position as well as others for which he may show potential. This in itself tends to improve management over-all because it acts as a stimulus for other planning that is necessary in order to make intelligent estimates and appraisals of future organization needs and requirements.

It provides avenues of promotion and delineates lines of communications and counselling. It also defines the areas of responsibility, authority and, most important, the degree of accountability.

This inventory of management talent will show many things — some good, some not so good. In any case, the evaluation at this point must again take on a rather practical aspect. It must include, among others, such things as a determination of the age of this group. Otherwise you may have talents or potential that can never be utilized or realized because of time limitations, turnover, retirements or disability. Furthermore, the proper timing of special training and development is important if the individual is to be prepared and ready to be moved into another more responsible assignment when such vacancy occurs. Only careful analysis and forward planning can make this possible.

Appraising Job Performance

THERE must also be built into the organization a method of appraising the performance of each person who is under management surveillance as a potential candidate for consideration for promotion or further development. This can best be done through close and direct observation of the day-to-day performance and attitude of the employe under consideration. This applies both on and off the job, where possible. In this connection also, it should be noted that job requirements or specifications cannot remain stagnant or static. They must be reviewed and revised from time-to-time to make certain that they are meeting the constantly changing pattern of telephone techniques.

For example, traffic management has tended, over the years, to deal specifically with the proper handling

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of operator functions. Certainly there is no objection to this but it has tended to place greater emphasis on the personal aspects of the operation rather than the physical or equipment function. At one time this may have been satisfactory.

It now becomes apparent, however, that with the ever-increasing move toward technological changes in telephony and the gradual elimination of the human element in certain areas, that a much greater emphasis must be placed on making certain that traffic management understands the physical and technical phases of equipment operation.

This then requires that our specifications for management personnel in traffic be altered to provide individuals who can cope with, and manage, the operation from a technical viewpoint. This is also true of many other areas of telephone operations. So it appears that some of us "old dogs" may have to learn some new tricks. We also may have to look in some instances to other sources for traffic management.

Future Managers

THIS BRINGS up a point that is too important to overlook or ignore. That is the source of supply for future management. If we are to have a successful plan for development and promotion of present employes, then we must recognize, and make provision for, the replacement of these individuals in the organization. Responsible management must intelligently analyze the specifications for each position and then determine where these requirements could best be met from within the present organization.

Then there must be a method of supplementing the over-all organization manpower deficiencies by recruiting, selecting and placing qualified applicants from sources outside the organization. No management development plan can long exist or be successful without a constantly maintained high standard for selection of applicants for employment. This standard must be frequently reviewed to make certain that it has the ingredients to produce a grade of employe of the best quality and that it is meeting the changing requirements for improvement.

USITA Traffic Conference Speaker F. W. HAMPER, operating vice president, General Tel. Co. of Ohio, Marion.

Every member of management needs guidance from time-to-time on the important items to analyze and evaluate in considering an employe for promotion. There may be many differences of opinion on this, but, in my opinion, certain factors must be considered, weighed, and weighted in each case. The ones that I think are most important and have the broadest application are these:

(1) *Effectiveness of the employe* in his present position — only under unusual circumstances will you find an employe performing poorly in his present position, yet eligible for promotion to another.

(2) *Previous experience* in positions that would qualify the employe for job specifications of the new position — there is very little that can be substituted for experience.

(3) *Age of employe* — this, as was indicated before, assists us in determining the timing of our decision as it applies to the individual.

(4) *Number of years of service* — again, when considered with age and other factors, helps us to intelligently plan the timely movement of personnel; gives due regard to seniority.

(5) *Educational background* (including informal training as well as formal schooling) — the significance of this factor becomes greater as the demand for more technical knowledge and special training increases.

(6) *General attitude of employe* — wrapped up in this factor, among other things, are persistence and loyalty — the attitude that succeeds where others fail.

(7) *Personal qualifications and characteristics* (including general physical condition) — it is imperative that the employe have the emotional, physical and mental capabilities to progress; each one must be measured against his own maximum limitations.

Now then, to intelligently make this evaluation to arrive at a proper decision, it might be helpful to employ the following media: (1) Personal judgment of top management; (2) supervisory rating of performance or management appraisals; (3) selected scientific tests; (4) personnel records; (5) personal interview; and (6) physical examination.

The final decision or determination should take into account all or most of these media and should not be made on the basis of only one or just a few.

It has not been my intention or desire to take issue with any system or plan of development that may have been set up or is in the process of design, but rather to point out and emphasize the pertinent points that, in my opinion, are necessary in any management development.

These components will vary, as they properly should, with the requirements and needs of each organization. However, on this basic skeleton can be built a dynamic, active plan of development which, when brought alive by a progressive and enthusiastic battery of managers, will produce a qualified high calibre management and a profitable operation.

Frederick R. Kappel, president of the American Telephone & Telegraph Co. (one of our strongest competitors), has summed it up very well when he said, "We will do the best job, I'm sure, when, and only when, every boss acts on the understanding that an indispensable part of his assignment is to do everything he thoughtfully and reasonably can to encourage the growth of his subordinates." — *F. W. Hamper.*

"Cable Pressurization Methods"

(Continued from page 63)

time at a minimum of cost, we decided to connect a high capacity compressor-dryer unit to all cable sheaths in a given office, "fire up" the machine, and pump air in all directions! By so doing, our largest cables would receive immediate protection. As time permitted, we would check pressures along the cables, plug major leaks, and thereby extend protection to the balance of the cables.

Once given the "green light," we embarked on this new approach. Since there were no satisfactory compressor-dryer units available at the time, we improvised our own assembly. A large air compressor was combined with a dryer to produce 5,000 cubic feet of air per day at 10 pounds pressure. This unit was installed in our Main Central Office, replacing our original 200 cubic foot unit. It was connected to 54 cables, which fanned out from this office.

When the unit was turned on, we discovered that each of several cables was consuming 300 to 400 cubic feet of air per day. We found that only 12 trunk cables were airtight, while the remaining 44 were not. We dispatched crews to locate and plug the larger holes, and immediately the air consumption dropped to normal levels.

So successful was this new method that it was extended to three other large offices in Honolulu. Two of these offices were equipped with our improvised assemblies, while the third office was equipped with the original compressor-dehydrator unit — the capacity of which had been increased from 200 to 2,000 cubic feet per day by replacing the compressor with a larger unit. This initial phase of the program was completed in the fall of 1956.

In order to extend cable protection to our many smaller offices, we searched for and found a compact refrigerator-compressor air dryer with a capacity of 500 standard cubic feet of air per day. This unit operates on what is known as the "Squeeze Freeze" principle. Air which is compressed to about 150 pounds pressure per square inch is then cooled to approximately 32°F.

USITA Plant Conference Speaker L. W. ROBELLO, general plant manager, Hawaiian Telephone Co., Honolulu, Hawaii.

As a result of this process, approximately 75% of the moisture in the air is condensed in the form of liquid water, which is drained periodically. A further reduction in the moisture content of the air is accomplished when the air is expanded to about 10 pounds per square inch and warmed to atmospheric temperature. The foregoing process of moisture removal will reduce the relative humidity of ambient air from 100% at high temperatures to about 2% at 70°F.

We investigated, liked what we saw, purchased and installed many of these units in our smaller offices. We have found them to be well designed and economical. They also have a considerable reserve capacity for short lengths of time. This is very important. It has been our experience that this reserve capacity is extremely effective during bad storms and when accidental sheath breaks occur.

Selecting The Proper Compressor-Dryer

IN ORDER to choose a compressor-dryer unit of the proper capacity, it is first necessary to estimate the approximate daily air consumption

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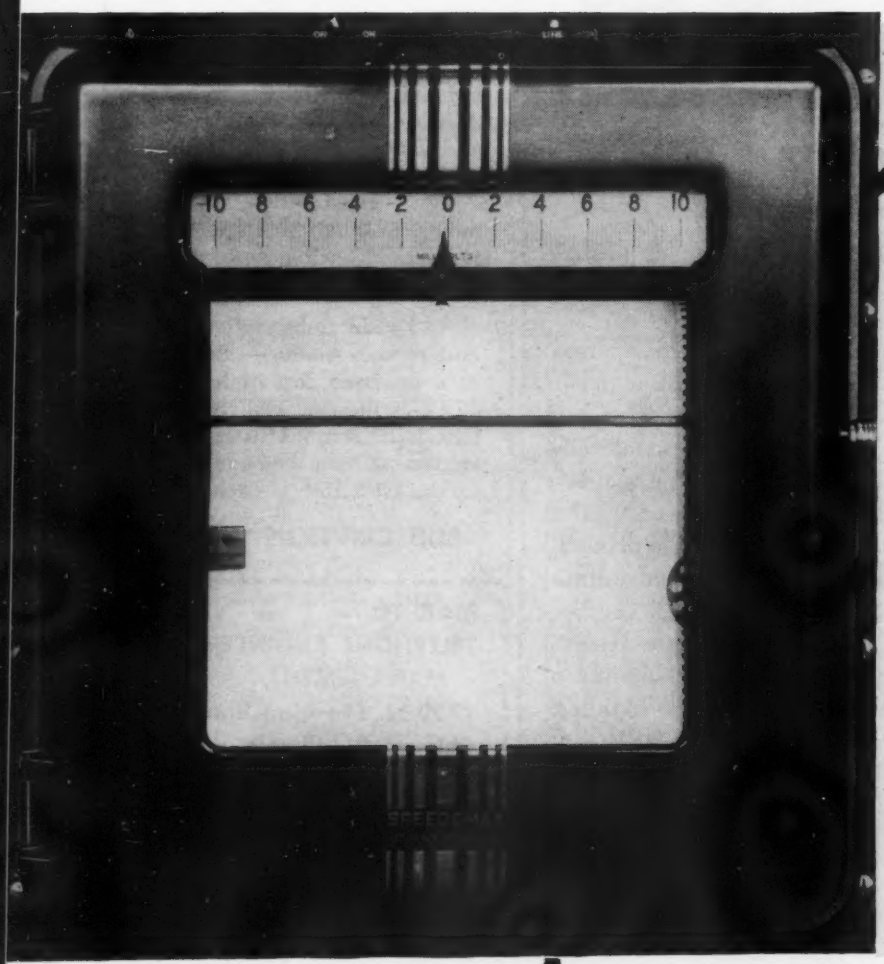

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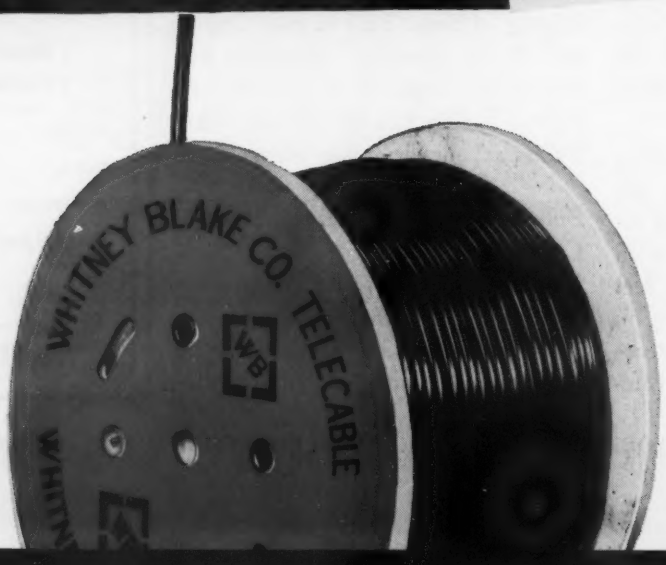

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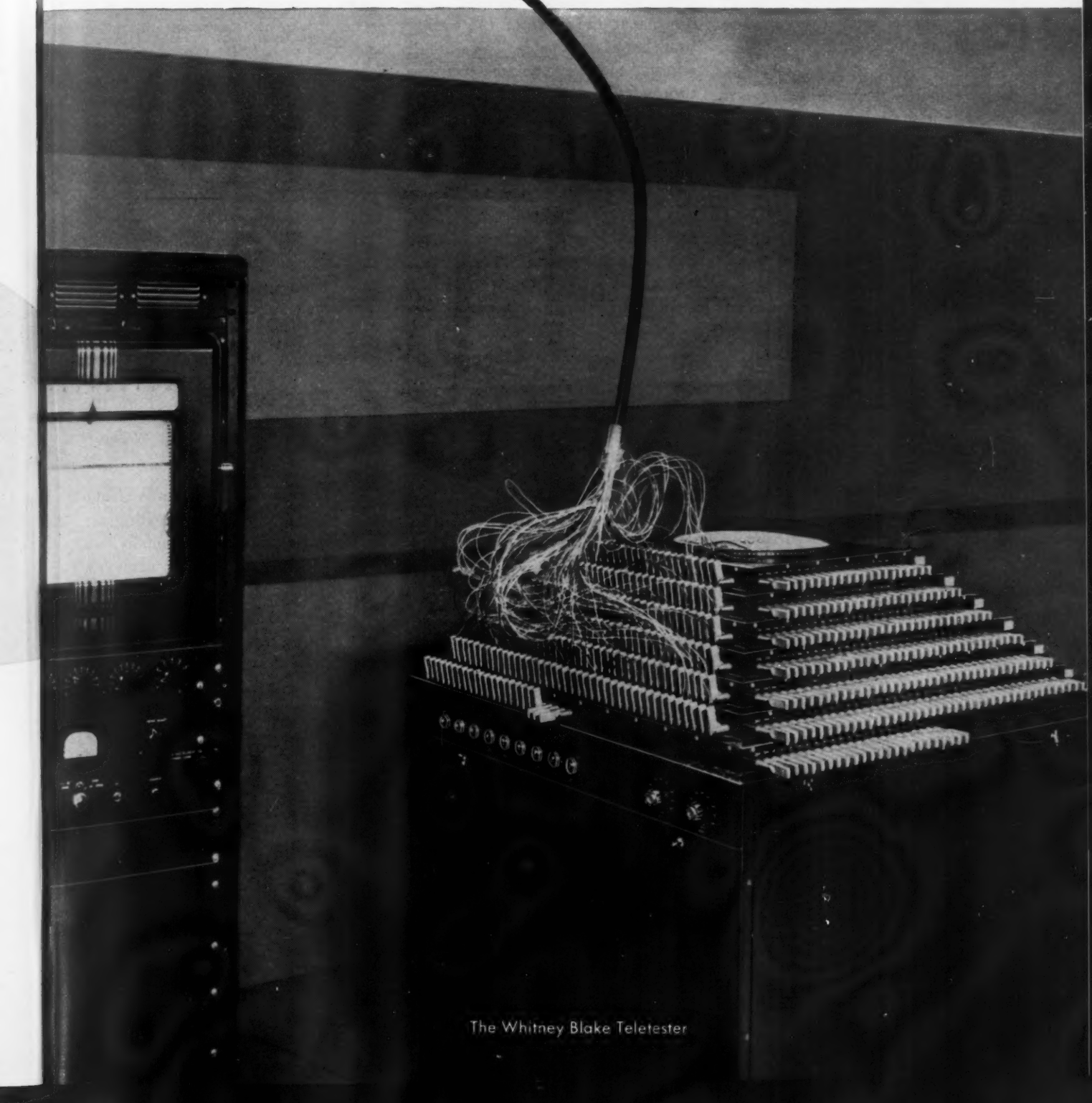

The Whitney Blake Teletester

for the office. Initially, we determine the total sheath miles of cable out of the office to which pressure will be applied. We then relate this figure to the condition of the cable and determine the capacity as follows: seven cubic feet of air per day per sheath mile for cable that is in good condition, 10 cubic feet for cable sheath in fair condition, and 12 to 14 cubic feet for cable that is in poor shape.

No Continuous Feed Pressure System can operate successfully without plugs. It is necessary to plug each cable in the cable vault to prevent air from flowing out into the switchroom at the main frame. It is important that the plugging be done in the paper or pulp-insulated portion of the cable and not the tip cable.

We also use plugs to stop the flow of air at points where cables connect to distribution terminals or any other non-gastight terminal that may be leaking excessively. We have been using what is known as the "cold resin" type of plug, which is composed of a mixture of two liquids. When injected into the cable, a chemical reaction takes place to form a hard plastic plug. The cold resin plug has proved to be very effective and quite economical to use, and we have been able to make 3 to 4 of these plugs in about the same time originally required for 1 asphaltum plug.

Other Necessary Equipment

THUS FAR, I have discussed only the compressor-dryer units we have used. However, the success of any Continuous Feed Pressure System is dependent upon several other items of equipment.

In order to measure the volume of air flowing into the cables, we first decided to use liquid petroleum gas meters, commonly referred to as LPG meters. Each meter was connected in series with the air supply tube which was connected to the cable sheath. Connections were made by using copper tubing.

When put into operation, these meters furnished us with a daily record of air consumption for each cable; but we found that the meters gave no reliable indication of leakage from the cable sheath if the leak occurred more than 2,000 or 3,000 feet from the central office because cable resistance limited the flow of air.

Because of this, we had no way of determining whether or not the far ends of the cables were protected. This presented us with another problem.

We learned that a so-called "end-pressure switch" had been developed and that it would indicate the presence or absence of protection at the far ends of cables. We purchased some of these switches, installed them, and have found them very successful.

These end-pressure switches, which are operated by small pressure bellows, are connected to the cable sheaths at the ends of the various branches of each cable. The switch is adjusted to operate on whatever pressure normally exists at that point, usually 1¾ to 2 pounds per square inch.

The contacts of the switch are connected across a subscriber's cable pair in the terminal near the location of the switch. This switch is so designed that if the pressure in the cable is above the value of the switch adjustment, the electrical circuit is open to the subscriber's line.

When measured, the line shows an insulation resistance of 5 to 20 megohms. If the pressure falls below the preset value, the switch closes and a 330,000 ohm resistance is placed across the subscriber's line. You may be wondering what effect this has on the subscriber's service . . . Actually, this resistance does not affect transmission, ringing, or supervision in any way.

It is possible to test all cables equipped with end-pressure switches on a regularly scheduled basis from the testdesk and thereby determine whether or not a given cable is under pressure. It is important that records be kept of these tests as well as locations of end-pressure switches and telephone numbers to which they are connected. Our experience has shown that during rainstorms and also windstorms, when flying objects may cause damage to aerial cable, it is important to step up the frequency of these tests.

I cannot overemphasize the importance of maintaining adequate pressures in the cables. We have installed test valves at various points along the cable routes to accurately measure the pressure at those points. With 10 pounds of pressure at the central office and an objective of two pounds at the end-pressure switches, the required pressure at intermediate test points would vary roughly with the distance from the central office.

We do not get a direct relationship between distance and pressure because of variations in the rate of air flow along the cable route. These variations are caused by changes in cable size, branch cables, leaks, interconnected sheaths, etc. To determine the proper pressure at a test point, it is necessary to use a certain amount of old-fashioned "horse sense."

During some of our recent rains, we have inspected flooded manholes and, in several instances, have discovered strings of bubbles rising from the submerged cable. When time and manpower became available, the manhole was pumped out and the sheath break repaired without opening the cable sheath. In most of these cases, service was not interrupted by the sheath break, as would have been the case if the cable were not under pressure. Usually, leaks of this nature are too small to operate the end-pressure switches or to be indicated on the flow meters.

Locating Air Leaks

ANOTHER important phase of our program is that of locating air leaks in the cable. (Incidentally, we do not recommend flooding manholes, or the "string of bubbles" method, to locate leaks in the cable!)

Where we have a series of pressure test valves along a cable length, we find that the so-called "gradient method" is quite reliable. This is the same method originally developed for the static system. Leaks are located by the use of a soap spray applied to cables in manholes. The same type of spray is applied to aerial cables by means of a unit that rides the messenger on a wheel. This method is very convenient and fast.

Special precautions are necessary to maintain protection in pressurized cable when cable sheaths are opened

for transfers or for any other reason. If the opening is to be made within approximately 1,500 feet of a compressor unit, it may be necessary to turn off the supply of air to the sheath being opened to prevent the leak from causing an overload on the compressor.

If the opening is to be closed the same day and the weather is good, no other precautions are needed. However, if the sheath is likely to be open for several days, the pressure beyond the opening will fall low enough to result in loss of protection. In this case, tanks of nitrogen gas may be connected to the sheath through regulators about 1,500 feet beyond the opening to keep the pressure up. It is essential that these tanks be checked fequently to guard against their being depleted before the sheath is closed.

To date we have applied the Continuous Feed Pressure System of cable protection to our plant on the five major islands in the Hawaiian group. We have equipped 29 of our 58 central offices with compressor-dryer units, and some of our smaller offices which have relatively short cable runs to be protected are equipped with nitrogen cylinders. On the island of Oahu alone, 1,050 sheath miles of cable serving approximately 154,000 stations are now receiving varying degrees of protection.

We are continually striving to improve our operations. As an example, we have recently found it more economical to use plastic tubing than copper tubing for interconnections between the dryer units, the meters, and the cables. We estimate that this will save 60 to 70% of the installation cost.

Another economy was brought to light recently in the form of flow raters on our panels in place of meters. We found that the flow raters are less costly and just as effective. We have recently assigned a supervisor to work full time with our Plant Staff in developing Continuous Feed Pressure System practices and to outline detailed duties and responsibilities for employes of each work group involved in this operation.

Our Engineering Department is now issuing job plans which show both new and rearranged cables in relationship to existing dry-air pipelines. Plugs, test valves, end-pressure switches, and associated pressurization controls are indicated on all cable drawings.

A further refinement to our pressurization plan is the zoning of exchange cable plant in order to provide optimum protection to major feeder routes. Feeder routes are zoned according to the size of the cable — the largest cables being contained in "Zone A." As the cables decrease to a predetermined size, the area is classified as "Zone B," and so on down. An over-all map of such an exchange area will show concentric circles fanning out from each central office.

I would like to briefly summarize the major steps we are following in Honolulu to put this new plan into effect:

(1) Establish a priority list of the offices in need of cable protection;

(2) Plug all cables in the vault of the office selected;

(3) Select and install the proper size compressor-dehydrator unit;

(4) Establish feeder route zones for the office;

(5) Install pressure test valves along "Zone A" where the sheath diminishes to less than 600 pairs and record pressure readings at the time the valves are placed;

(6) Do only enough routine work on the cables with the lowest test-point readings to obtain about 6 pounds pressure at the "Zone A" test valves; and

(7) Repeat these steps in each successive office until "Zone A" protection is assured.

After the cables in "Zone A" are adequately protected, concentrate on cables in "Zone B," etc. This plan provides relatively inexpensive insurance during the time the cables are being progressively routined to obtain positive pressure throughout all important sections.

At the beginning of my talk, I mentioned the loss we suffered during a storm that hit the island of Oahu on November 28, 1954. Let me tell you what happened 3½ years later, and then you can judge for yourself whether or not cable pressurization is worth while.

On March 6, 1958, the weather forecast was: "Overcast skies and intermittent rain, heavy at times. For Wednesday night and Thursday, continued cloudy with frequent showers."

This proved to be the understatement of the year. The official 24-hour report was 17.80 inches at the Honolulu Airport, 17.41 inches in downtown Honolulu, and as much as 24 inches in some parts of the island. This is about 1/2 our annual rainfall for Honolulu. The 17.41 inches of rain in downtown Honolulu broke an all-time record of 13.52 inches established in 1917. Automobiles were completely covered in some places; roads and homes were damaged; and many of our underground cables became submarine cables overnight!

Remembering how costly the 1954 storm was with nine inches of rain, and how many telephones were out of service, we shuddered to think what twice as much rain would do. Our comparative report on the storms will give you an idea of what happened.

In the November, 1954 storm with 9.27 inches of rain in a 24-hour period, we experienced 253 cases of cable trouble, some of which were in 2100-pair cables, and received in excess of 10,000 subscriber reports.

In the March, 1958 storm with almost 18 inches of rain within a 24-hour period and with 30% more telephones, we had 105 cases of cable trouble, most of which were in small cables, and only 3,178 subscriber reports.

Expressed another way, our cable plant sustained 30.1 service-affecting sheath breaks per 100 sheath miles of cable in 1954 before pressurization and 10.5 sheath breaks in 1958 after pressurization. This represents a reduction of 65% in the number of service-affecting troubles after the cable plant was pressurized.

Pressurizing telephone cable plant is very worth while — not only in reducing maintenance costs, but what is equally important — maintaining uninterrupted telephone service to subscribers. — *L. W. Robello, general plant manager, Hawaiian Telephone Co., Honolulu, Hawaii.*

"Take A Giant Step"

(Concluded from page 51)

geography and other considerations make this practical. I think there should be more examination of advantages to be gained from joint contracts and pooling arrangements for such services as maintenance, purchase of materials and supplies, advertising, legal counsel, and perhaps billing and collecting. Several small organizations together can hire high-quality specialty services that are generally available only to the larger concerns. If more of this could be done on a volunteer basis, it might be another giant step in operating economies that would permit still broader rural telephone service.

With each passing year, we find it more feasible to carry telephone service to those overlooked households and rural industries out on the fringes and in the isolated pockets. The products of modern engineering and new developments in the science of communications bring these people into the market. Microwave, subscriber carrier, buried plant, longer spans — these are giant steps that make your job of rural area coverage possible.

Those of you who already have experience with the REA rural telephone program know the extent to which this agency will go in order to help you put modern equipment and dependable service out there where the need is greatest. Our REA engineers have had good cooperation in working with equipment manufacturers and material suppliers on new developments. Working with all segments of the telephone industry, we have helped build a reservoir of engineers. Our field people will continue to devote their abilities and experience in helping you find ways of putting together feasible loan proposals. I think relationships between small Independents and their connecting companies are good and still improving.

As REA marks the 10th anniversary of its rural telephone program on October 28, I think we can take both satisfaction and hope in the giant strides taken, hand in hand, toward adequate rural service. — *David A. Hamil.*

"This 'Priv Line' on this order is an abbreviation for private line!"

"Carrier Maintenance"

(Continued from page 57)

cibels (dbs) relative to a reference of 1 milli-watt of power across 600 OHMS. Thus, all dbm references indicate so many db above or below 1 milliwatt across 600 OHMS.

Calibration is accomplished by setting the oscillator frequency control to 1000 cps, unless otherwise specified, and adjusting the oscillator output control until the V.T.V.M. indicates O dbm., the power to be injected to the drop of terminal A.

Figure A-3 illustrates the necessary test equipment at the receiving terminal of the facility. Again, the 600 OHM resistor represents the terminating load which is connected to the carrier drop across which the V.T.V.M. is bridged.

Figure A-4 illustrates the test equipment setup for actual measurements of net loss.

The carrier input impedance is nominally 600 OHMS; thus the V.T.V.M. at terminal A should indicate nearly the calibrated figure, O dbm. The reading of terminal B should indicate the net loss. Net loss in the opposite direction is determined by sending from terminal B and receiving at terminal A, following the same procedures.

Carrier Channel Frequency Response Measurements

WHAT IS meant by carrier channel frequency response? Simply stated, one might say it is a graphically plotted curve representing Frequency vs. Attenuation in the pass band of a carrier channel. A carrier equipment manufacturer often specifies the channel frequency response with reference to net loss at a frequency of 1000 cps. A typical example is +1, —3 db,

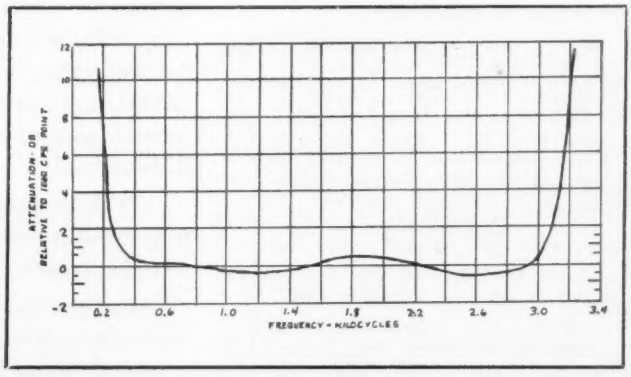

FIGURE B-1: — Channel transmission frequency characteristics.

reference 1000 cps. Net loss — between 300 and 3100 cps. Specifications such as these are fixed on the basis of a back-to-back connection and represent no line irregularities which may occur in actual practice. *Figure B*-1 illustrates a typical response curve.

The importance of determining and maintaining suitable channel response characteristics can best be summed up by making reference to an engineering letter dis-

Please turn to page 86

MICROWAVE
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OPEN WIRE
SYNCHRONOUS CARRIER SYSTEMS

Collins now offers compatible Carrier Systems for open wire, cable and microwave transmission facilities. These systems present a unified solution to the requirements imposed by the increase in wire line and cable systems for short haul applications, as well as the increase in microwave radio. Collins systems enable interconnection of channels at carrier frequencies for various open wire, cable or radio combinations.

Carrier channels may be extended to remotely located microwave sites by open wire or cable lines — or small groups of carrier channels may be extended over wire lines to light traffic areas in different directions. Collins Microwave, Open Wire and Cable Carrier Systems are readily integrated with existing wire line and cable facilities as well as with similar types of existing carrier systems.

The Collins MX-102 Microwave Carrier System can provide up to 240 duplex voice channels on an RF path; the WMX-102 Open Wire Carrier, 12 duplex channels on each open wire pair, is available with "NA" or "SA" allocations and is suitable for operation over lines transposed for "C" and "J" type carrier; the CMX-102 Cable Carrier, 24 duplex channels on two cable pairs, is designed for application to "N", "ON" or similar type cable facilities. All use the standard channel bank of 60 to 108 kc, reducing the number of modulations steps required when circuits are extended over several types of transmission media.

Features of Collins Carrier Systems include synchronous operation for efficient data transmission; complete regulation and frequency equalization for the particular transmission medium. Modular construction results in flexible system design, ease of expansion and simplified maintenance. For technical literature, write: Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

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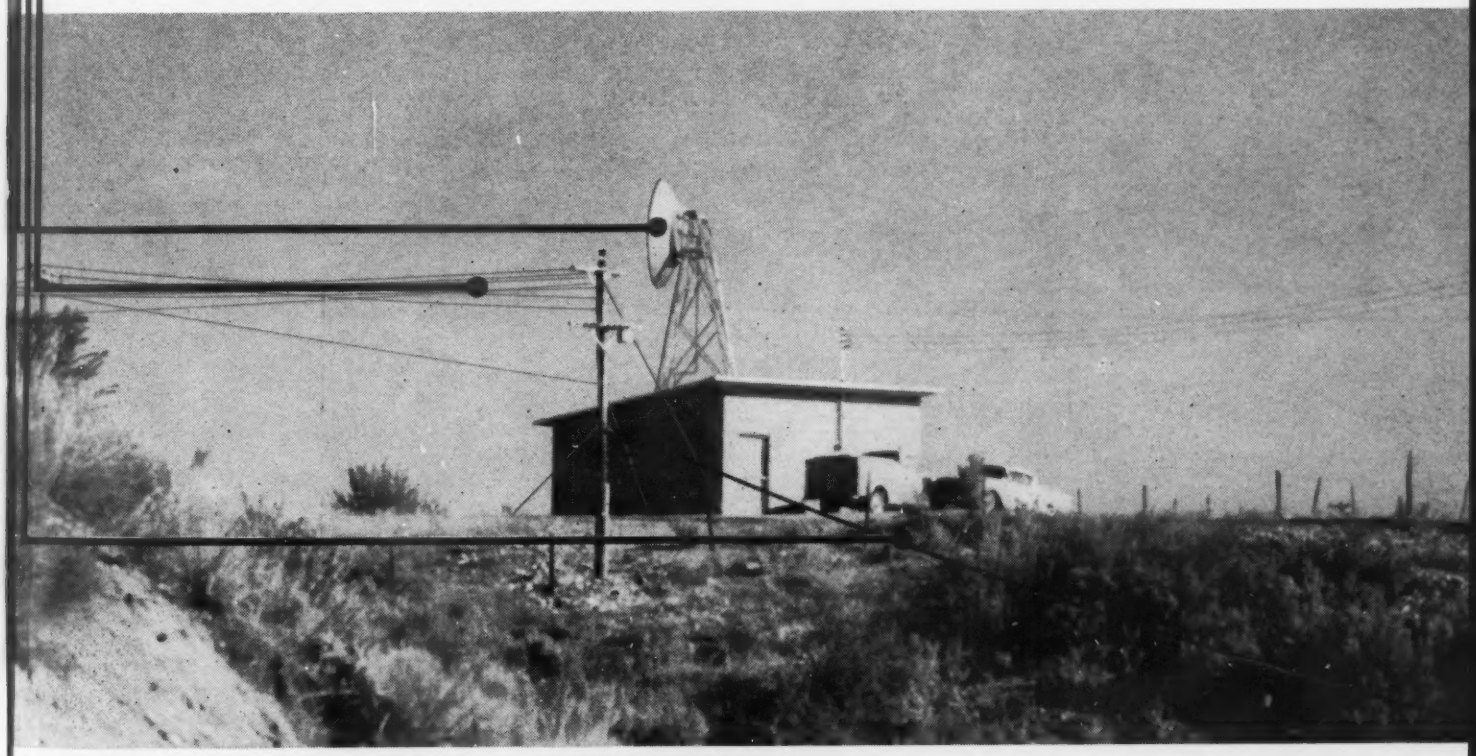

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tributed within the AT&T and Bell Systems, which lists technical specifications of circuits furnished the C.A.A. for remote control of Peripheral Air/Ground Radio Stations, Control of Vortac, and Air Traffic Communication Stations.

In short, it specifies the following response limits: reference 1000 cps net loss, customer to customer, of —8 to —9 db.

300- 500 cps loss	—8 to —15 db
500-2500 cps loss	—8 to —12 db
2500-2800 cps loss	—8 to —14 db
2800-3000 cps loss	—8 to —17 db

These requirements are most easily met with toll grade carrier facilities, but we must realize that a change in certain components of a facility could send our channel response measurements outside these tolerances and, in short, cause service interruption. It is thus just as important to maintain adequate channel response characteristics as it is to maintain proper net loss.

Carrier Channel Frequency Response measurements are made by following the same general procedures in making net loss measurements except that loss measurements are taken in 100 to 200 cycle increments from approximately 200 cps to a frequency where appreciable attenuation differences occur, relative to a reference of 1000 cps — a frequency where a difference of 10 db or more exists. Observation should also be made between these increments for sharp changes and results recorded.

TE&M's regular features will be in their usual places in the Nov. issues.

Noise Measurements

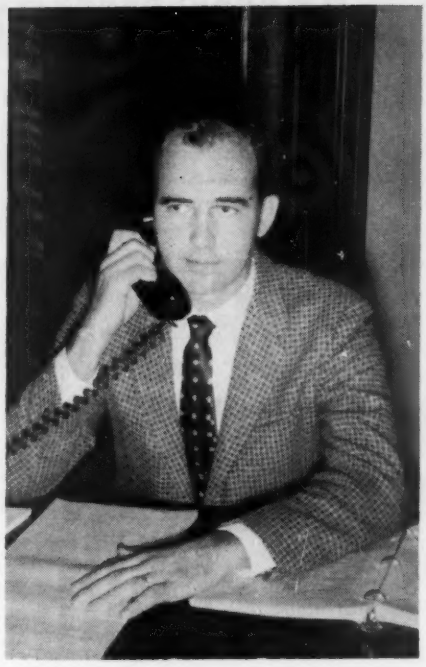
AN IMPORTANT perimeter which must be considered in the evaluation of facility performance is that of transmission impairment created by the amplitude frequency characteristics of noise.

While a small percentage of present day facilities may require special noise measuring devices, as in the establishment of Sage Data facilities, a major portion of the facilities will be voice grade and instruments such as the Western Electric Company 2 B Noise Measuring set may be utilized in determining the amount of noise interference present.

Although I have no intention of giving this group a lengthy dissertation on the fundamentals of noise, I believe that it is in order to discuss the origin of certain terms often referred to during discussions of noise measurement.

Bell Laboratories and other large organizations conducted considerable research to determine the interfering effect of different frequencies imposed on a special telephone hook-up. A large number of listening tests were conducted by different persons, using the same apparatus, while different frequencies were injected at a particular level. The tone was then removed and a 1000 cps tone injected and adjusted until the same relative interfering effect was observed. The results were then plotted as a curve as shown in *Figure C*-1 and is referred to as a Weighting Curve. Since these early tests were performed using the Western Electric 144 Handset, we refer to it as a 144 Weighting Curve.

What has this to do with noise measurement? Simply, that the interfering effects of different frequencies are relatively different. For example, using 144 line weighting, if two different frequencies, let us say, 500 cps and 1000 cps, were injected in a facility at some point, and at the same level, the interference of the 1000 cps would be approximately 15.5 db greater.



USITA Plant Conference Speaker PAUL E. MURPHY is superintendent of electronics, Telephone Service Co., Lima, Ohio.

It was further determined that at a frequency of 1000 cps a level of —90 dbm was at the threshold of interference and thus was selected as the reference power. All other interfering noise powers would be greater than this reference and would be expressed in dbrn or decibels above referenced noise.

Since these early tests, the Western Electric Company developed its FIA handset, and has since developed a representative weighting curve. This curve is shown in *Figure C*-2.

Further tests also indicated there was a 5 db improvement over the older type 144 handset. As a result,

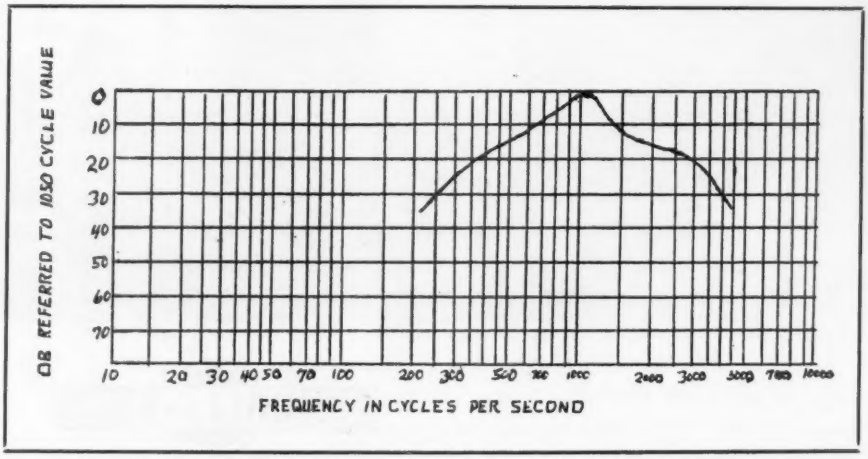
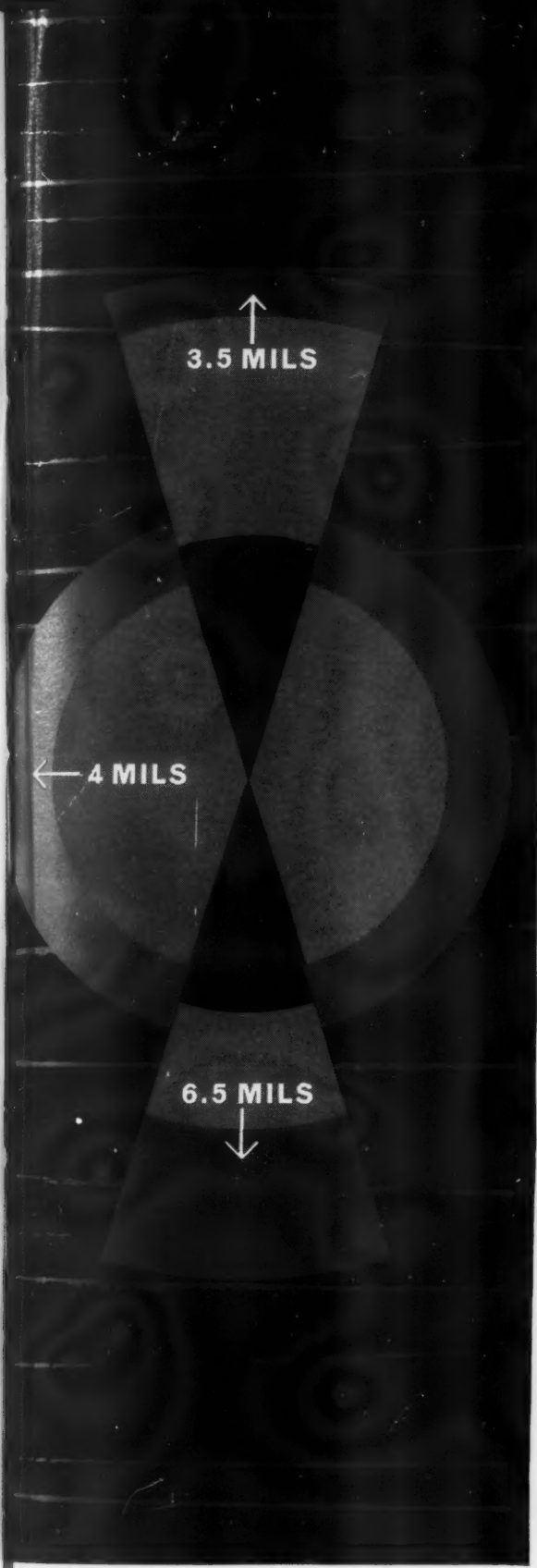


FIGURE C-1: — 144 line weighting.



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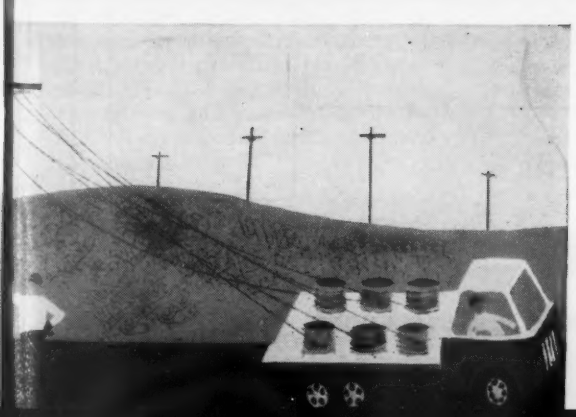

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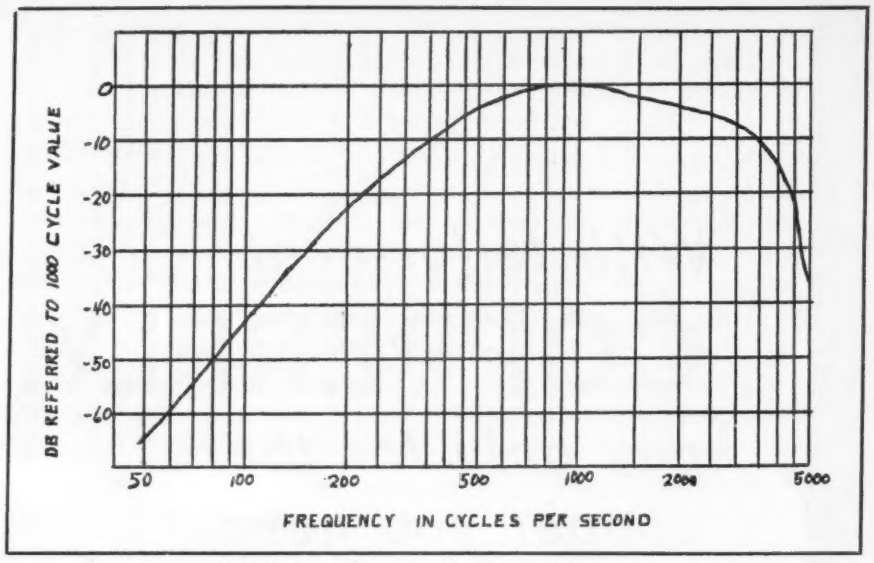

FIGURE C-2: — FIA line weighting.

the reference had to be modified. It was necessary to consider a frequency of 1000 cps at —85 dbm as the new reference and all interfering noise powers would be positive relative to this new reference or, so many db above reference noise adjusted. The new unit was designated dba or decibels adjusted.

With information provided by these curves, artificial weighting networks were constructed and incorporated into a noise measuring set, the Western Electric Type 2B. Other manufacturers have placed on the market similar networks which may be adapted to a V. T. V. M. as was previously discussed, to allow its use as a noise measuring set, and, in general, do a satisfactory job. *Figure C-3* illustrates a typical setup for measuring noise.

The V. T. V. M. into which the weighting network is inserted is calibrated to an entirely different reference than the 2 B Noise Measuring Set, but since the two instruments are calibrated in decibels (dbs) above or below a certain reference tone, comparative analysis can be made. For example: a —85 dbm indication on the V.T.V.M. using FIA weighting is comparative to O dba on the 2B set; likewise, 85 dba on the 2B Noise Measuring Set is comparative to O dbm indication on V.T.V.M., using FIA weighting. To convert a reading taken with a V.T.V.M., using FIA weighting, it is necessary to use the following formula:

DBA = 85 — reading of V.T. V.M. ± insertion = gain or loss of the network ± manufacturer's constant or correction factor.

One manufacturer lists this correction factor at+ 2 db and an insertion gain is specified at + 10 db.

If, for example, the V.T.V.M. as illustrated in *Figure C-3* would indicate —50 db, the conversion to dba would be calculated as:

DBA = 85 —50 (the VTVM reading) —10 (the insertion gain of the network) + 2 (the correction factor) or 27 DBA.

It must be pointed out that readings in dba are normally referred to a zero level point in the facility. If measurements are taken at a point in the facility other than zero level, then correction must be made.

If, for example, the noise was measured at the + 7 level, the noise would be 7 db greater than the O db level and, thus to make reference to the O db point of the facility, 7 db would be subtracted. The previous example of the formula becomes:

DBA = 85 —43 (the VTVM reading) —10 (the insertion gain of the network) + 2 (the correction factor) —7 or 27 DBA, same as before.

In nationwide toll dialing, present standards dictate objectives are for an average noise of approximately 30 dba for more than 50% of the time for an entire link. Some services may require better noise performance; however, some may not be quite as stringent.

Signaling Tests

IN MANY carrier systems, circuit design provides for signaling on a Ringdown or Dial Basis. The manner in which this arrangement is made possible varies with the system, but the end function remains the same, to activate a drop or light in ringdown operation or to pulse a relay actuated mechanism in dial operation.

Please turn to page 90

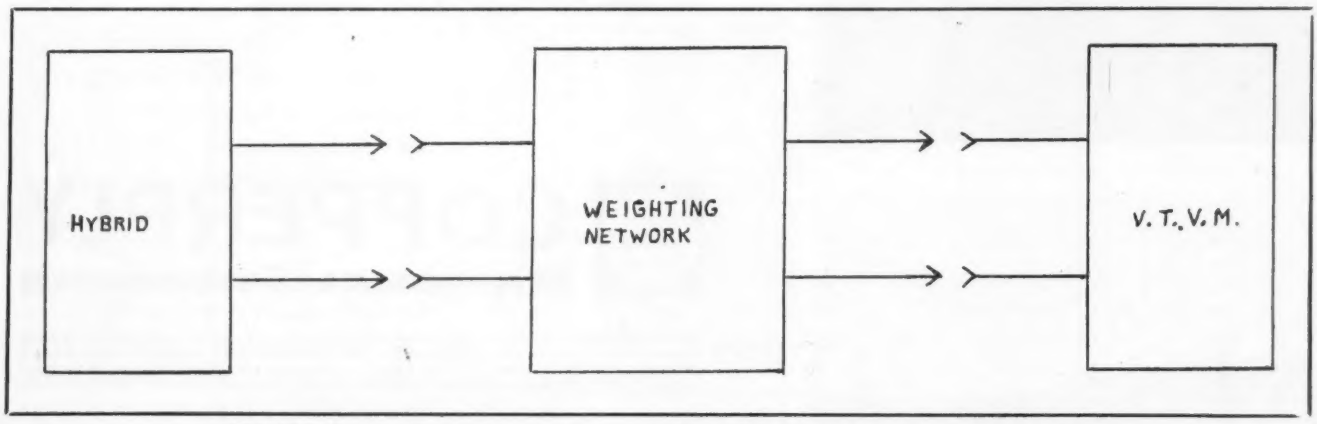

FIGURE C-3: — Typical setup for measuring noise on carrier channel. (2-wire).

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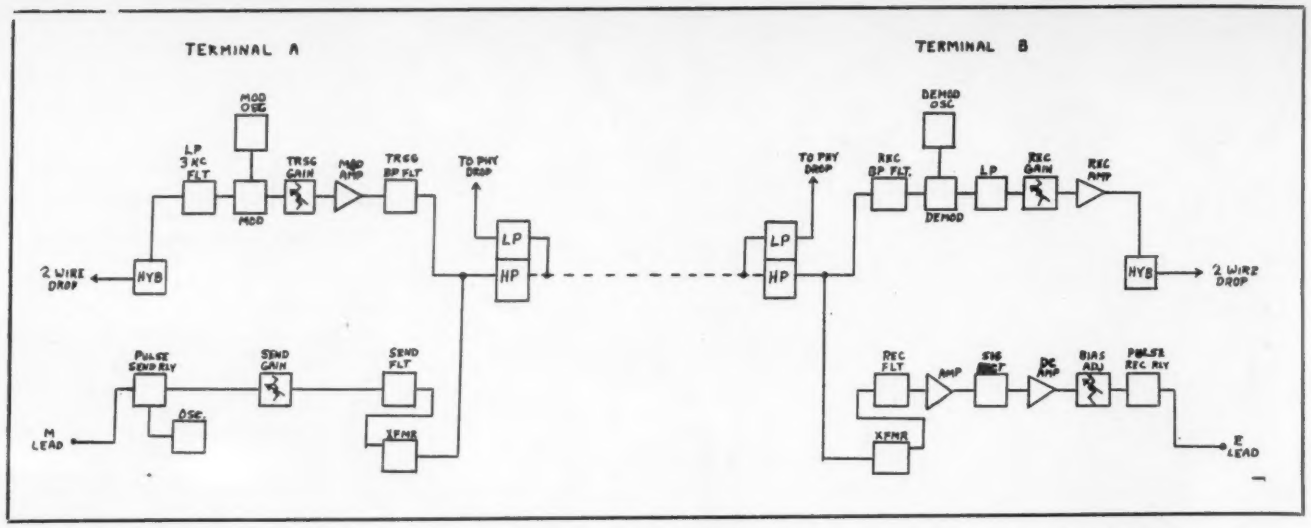

FIGURE D: — Block diagram of typical open-wire, single sideband, suppressed carrier toll channel.

Many of the toll carrier facilities presently being placed into operation are being arranged for E and M signaling, over which pulse — type information is transmitted.

In the maintenance of these carrier facilities, signaling tests are required to ascertain that little distortion is being introduced during transmission. The Western Electric 2 B Signaling Test or similar apparatus is often utilized to determine this condition. It may be used as a pulse sender or to measure the distortion of impulses derived from another source. In typical operation, the source of impulses is adjusted to the desired characteristics, connected to the "M" lead at one terminal, and at the distant terminal, a test set may be connected to the "E" lead so as to measure these incoming impulses.

While many carrier facilities are capable of following pulse rates up to 20 pps, as used for crossbar and panel-type systems, the normal pulse test rate for other type switching apparatus is approximately 12 pps. Also, for E and M type signaling, a normal 58% break pulse is applied to the "M" had from an associated trunk, while the carrier facility is adjusted to provide 58 percent break impulses to the "E" lead of a distant trunk. During routine testing, distortion in the order of 2 to 3% is permitted, while greater error must be corrected.

In many instances, carrier facilities will not meet the expected performance tests. It then becomes necessary to determine the cause of failure to meet these objectives.

Manufacturers of carrier equipments provide adequate material on the installation, line-up, and maintenance of their equipments. By following the step-by-step line-up procedures, troubles are readily localized and corrected.

Figure D, in part, shows a block diagram of a typical open wire, single sideband, suppressed carrier toll channel, being utilized for short haul application. Shown is the transmit section of terminal A and the receive section of terminal B, including respective signaling transmit and receive sections. In order to simplify, the transmit section of terminal B and the receive section of terminal A have been omitted.

Lining Up Carrier Channel

In general, the following steps are required in lining up the typical carrier channel:

(1) Adjustment of power supply voltages.

(2) Adjustment of oscillator frequencies and setting of the oscillator output levels.

(3) Setting of transmit power of signal and carrier sections.

(4) Setting of receive output to obtain desired net loss.

(5) Adjustment of signal receive section to obtain proper signaling requirements.

These are the basic steps. To discuss these steps would be beyond the scope of this paper. For the present, I must leave the details to the maintenance people and their ability to read the material that is available.

The use of carrier to provide the services being requested by telephone users is ever on the increase. Satisfactory performance is engineered into these facilities, but it is up to the maintenance people through routine testing to see that this "Engineered-in" performance is kept; in short, to see these users are pleased with our service. Service is our product, we have nothing else to offer. — *Paul E. Murphy.*

Commercial Aspects of Automation

(Continued from page 61)

in contact with these customers. If we convert our exchanges to dial operation, discontinue business offices in small towns, create collection agencies supervised by people other than telephone employes, it is not possible for the industry to keep "the common touch" that is so badly needed in order that adequate public relations might still be maintained.

Neither chance nor mere good fortune has brought this nation the finest telephone service in the world. The American people today enjoy this service as a result of their own enterprise and common sense. The people of this nation have found more and more ways to use the telephone

in their daily lives. They have encouraged initiative and invention. They have made the job of providing telephone service a public trust.

At the same time they have given the telephone companies under regulation the freedom and resources to do their job as well as possible. In this climate of freedom and responsibility, the telephone companies have provided service of steadily increasing value. In the years since World War II, the public demand for service has been so great that the industry has carried out the most extensive construction program ever undertaken. The people in America made this program possible.

Now, some 15 years after the war, the term "extended service" means much more than being able to provide a telephone for those who want it. Today the telephone in America has gained many new dimensions as the industry offers more and more things to meet the wants of the American people, things that add even more variety and convenience to its service: telephones in attractive colors that blend or contrast with any decorative scheme; telephones with illuminated dials that can be seen in the dark; telephones with push buttons to answer several lines; equipment that will automatically answer calls when no one is in and give and take recorded messages.

These are only a few of many. Telephone men and women with experience and skill backed by the great flexibility of their communications network are writing the story of steadily improving telephone service.

It is with concern now that we review some of the aspects of automation that confront us in the Commercial Department. We want to take this opportunity to discuss a few of these things previously mentioned with you now.

My company has been very active in the conversion of its exchanges to dial. At the end of World War II, we were approximately 25% dial. We are now about 91%. We have experienced many problems along the line.

One of the greatest, I believe, was subscriber education and acceptance of the company's dial program, particularly so in small communities where it was necesary to convert either magneto or common battery exchanges to a non-attended dial operation.

E. H. UTZMAN, commercial superintendent, The Southwestern States Tel. Co., Brownwood, Texas, presented this paper at the recent USITA Commercial Conference.

To do this we found it necessary to eliminate the business office and move all Commercial operations into a centralized business office. It was also necessary to create collection agencies on a contractual basis with people other than telephone company employes.

We received the usual subscriber complaints of not being able to call up the local operator and obtain the time of day or the whereabouts of the family doctor who did not answer his telephone. In other words, we began to lose the "common touch."

To overcome this condition we created a policy whereby our business office people in the commercial control exchange would contact by telephone at least 10% of the CDO subscribers each month. In these telephone contacts we tried to determine the subscribers' reaction to our service. While this method of subscriber contact has proved highly successful, it does not take the place of personal contacts that were possible through 100% local operation.

2-5 Numbering

IN OUR dial conversion program, we of course entered into the 2-5 numbering plan made necesary to fit

Please turn to page 94

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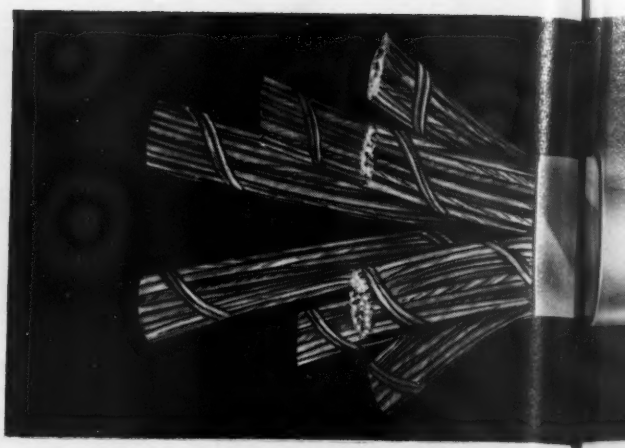

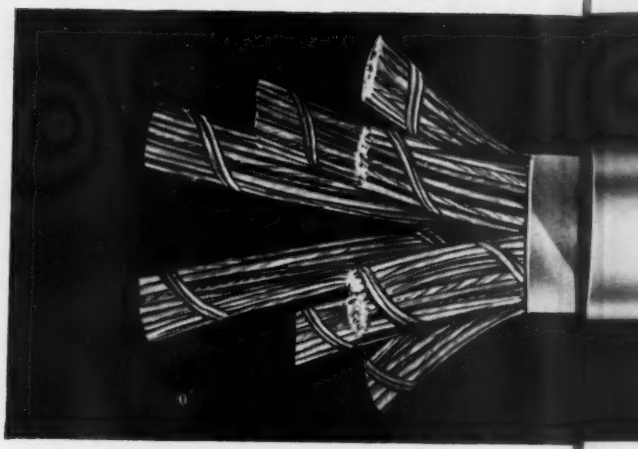

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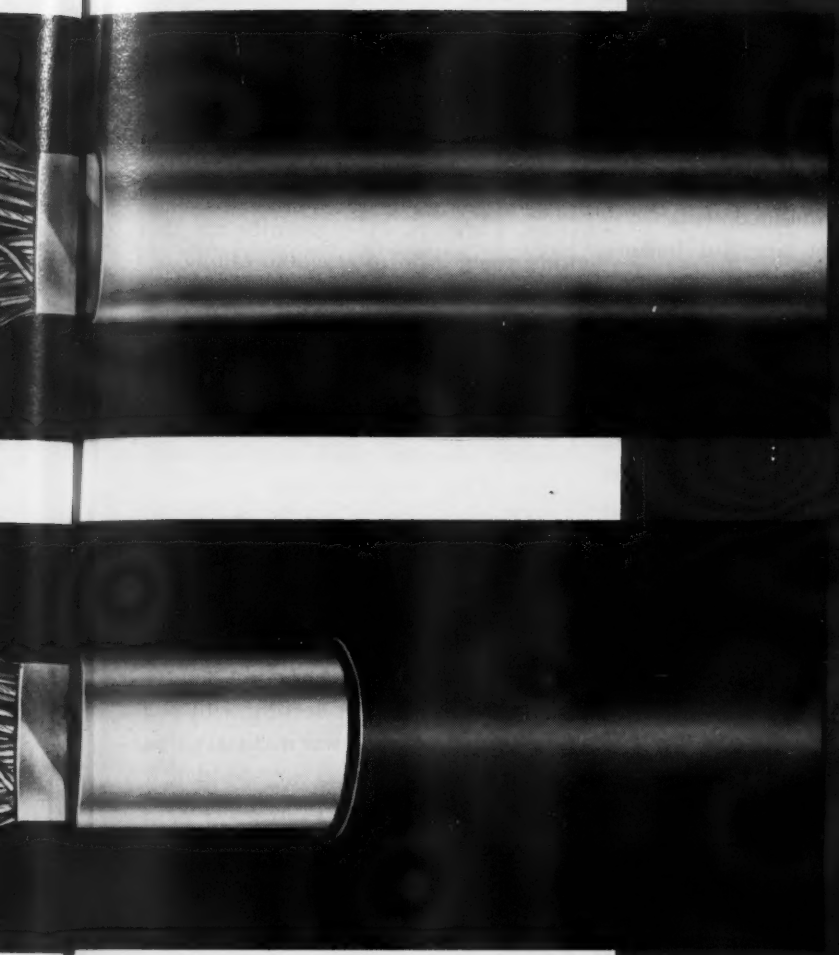

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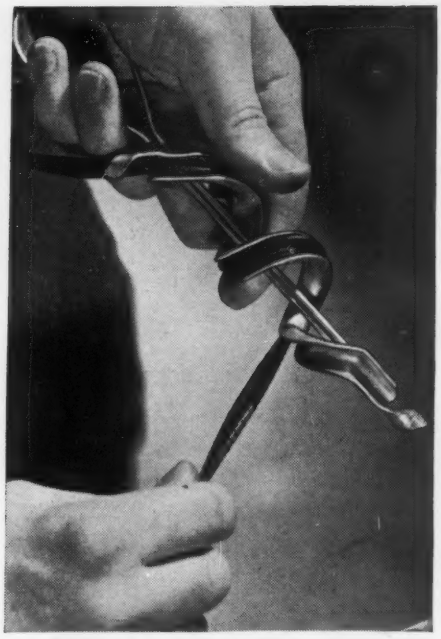

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into the national program designed for ultimate Direct Distance Dialing. Here again we were confronted with subscriber acceptance.

Many of you are very familiar with these problems, but let me say that we cannot overemphasize the need for proper subscriber education in order that this program might be carried out successfully.

To do this, we feel that at least in the larger exchanges a two-year program should be outlined. This would provide sufficient time for business customers to consider the necessity of number changes. It will help the business customer to plan his printing requirements where telephone numbers are used and to coordinate them with the telephone company's plans.

We feel the telephone industry has an obligation to provide the subscriber with new telephone numbers as far in advance as possible. There are many ways that this can be successfully handled. One way we have found that meets with very good subscriber acceptance is "dial number plates."

These plates are printed with the subscriber's number and mailed to the subscriber with an explanation of how to mount them on the telephone dial together with information as to when the new number will become effective. The use of dial number plates has proven successful particularly when dial conversions are made requiring a 100% number change.

Microfilming Of Toll Tickets

MANY COMPANIES today are microfilming toll tickets and mailing to the customer the toll ticket that was made by the operator at the time the call was placed. This has met with very good subscriber acceptance in the areas where it is used. However, it has created a need for proper subscriber acceptance.

Most companies that have used this method of billing toll tickets have first entered into a subscriber information program by notifying each subscriber of the company's plans, enclosing prints of toll tickets with detailed instructions on how to read and interpret them.

This is another phase of automation that affects our business offices. A company contemplating entering into a program of microfilming toll tickets should give consideration above all to the impact it would have on its public relations.

Machine Subscriber Billing

ANOTHER aspect of automation that affects our business office operations is machine subscriber billing. Today many companies are using some form of machine billing of subscriber accounts. Machine billing of subscriber accounts has created quite a burden on Commercial people. In most cases, it was necessary that the form of subscriber bill be completely changed since a punch card type of bill must be used.

Our company is one of the many companies that has entered into this program. While we have been able to improve many of our accounting methods, we have created problems, some of which we have not as yet wholly overcome in dealing with our subscribers. First it was necessary that we test subscriber acceptance of new billing practices and procedures. This was done by moving into the program gradually, billing only a few exchanges each month until finally all exchanges of the company were placed on machine billing.

There are many aspects to this phase of automation. You must first attempt to sell the subscriber on the fact that your company is trying to improve its methods of billing that will automatically provide him with an improved service. What we mean by improved service in this phase would be that the subscriber's account would be mailed out promptly when due regularly each month, affording the subscriber to become educated to our billing and collection practices.

Some companies have used a very satisfactory method of advance publication. This publication was in the form of letters going to each individual subscriber, informing him of the company's immediate plans together with some long-range planning information. We recommend this as a very advisable step when any com-

pany is contemplating entering into a machine subscriber billing practice.

Direct Distance Dialing

DIRECT Distance Dialing (DDD) is now in effect in many areas of the United States and is coming faster than many of us may realize. This is another form of automation that we people in the Commercial Department should give due consideration to.

The economic conditions of our nation today have brought about a vast increase in toll operation. Consequently, this condition has resulted in the advent of Nation-Wide Toll Dialing. The Nation-Wide Toll Dialing plan provides for satisfactory over-all service between any two telephones in this country and Canada, as many calls as possible being dialed directly by subscribers (Direct Distance Dialing) and as many as possible of the remainder being dialed by operators (Operator Distance Dialing).

It is important to realize that the only type of call which can be handled on a Direct Distance Dialing basis at the present time is a sent-paid, station-to-station call, which includes the largest segment of present toll traffic.

It must be possible to extend this call from start to finish under the control of the calling subscriber's dial. In other words, both the calling and the called parties must be served by a dial central office and all interconnecting equipment must be automatic in operation. Collect calls, person-to-person calls, pay station calls, calls to manually operated exchanges, and calls on which time and charge reports are requested must be handled by operators, as they are now.

I am sure that there is not a telephone representative that does not know these facts. We point them out, however, in order to direct your thoughts to some of the problems that the Commercial people are going to be confronted with whenever Direct Distance Dialing comes to any area. The public must be properly and adequately informed on just what class of call can be accepted by DDD.

Please turn to page 97

ENGINEERS

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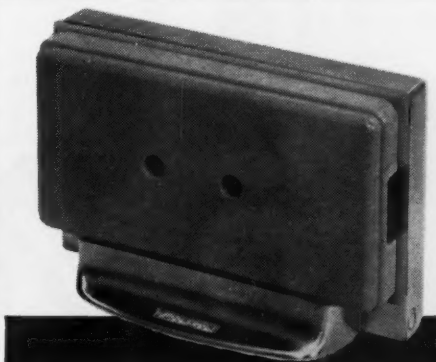

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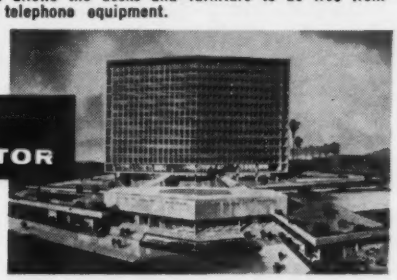
. . . outmodes all other methods of telephone installation

Model No. 104 — shown with standard telephone equipment — accommodates up to 8 No. 44-A Western Electric connecting blocks (4 on each side). Model No. 102 takes up to 6 (3 on each side), or if desired, the back of the Floor-Con can be used for external ringers, buzzers, or auxiliary equipment. This allows the desks and furniture to be free from all telephone equipment.



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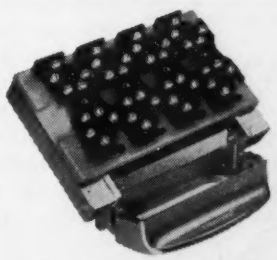

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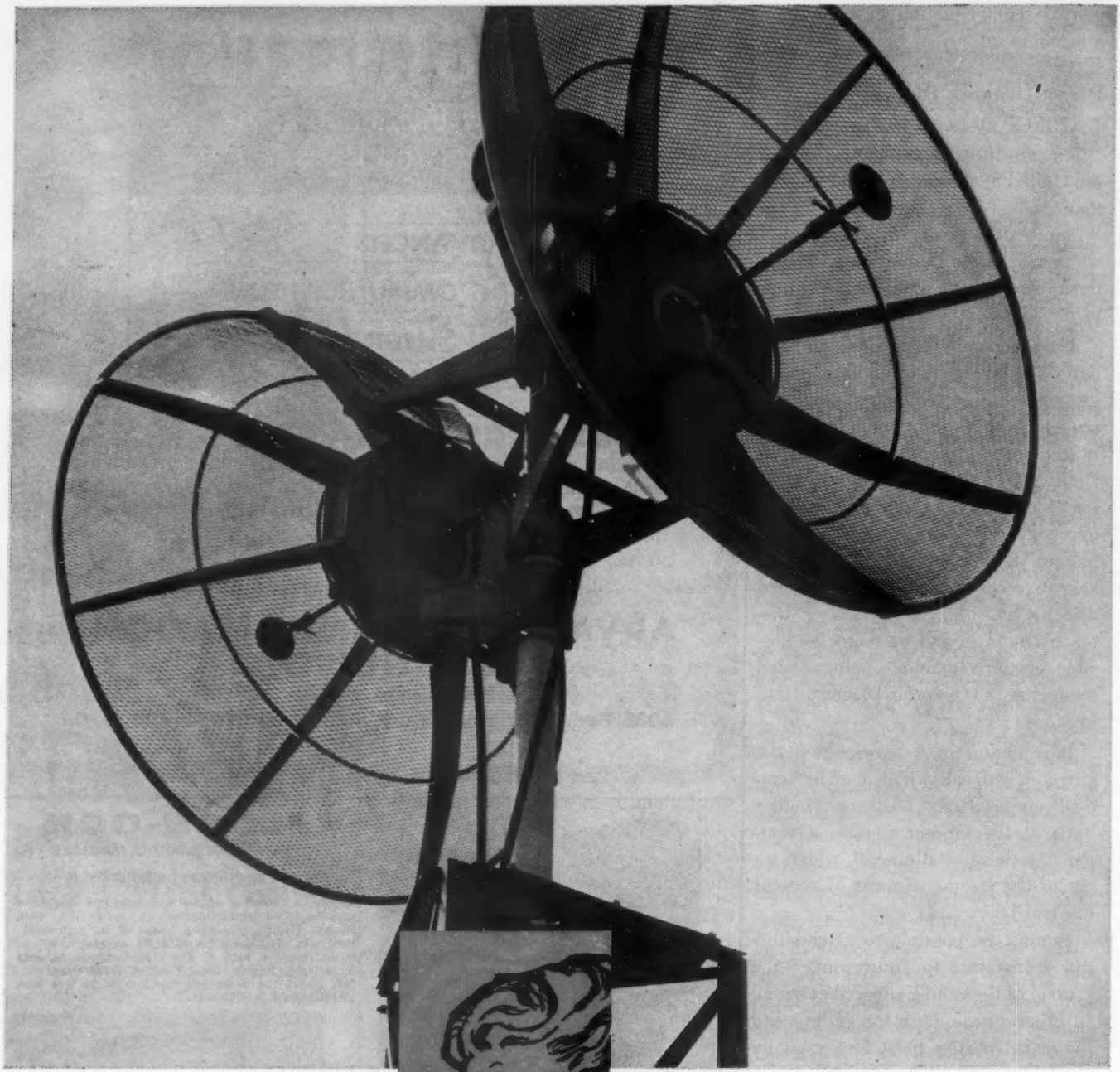

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In many cases, it will mean further revision of subscribers' bills.

Directories

WE OBVIOUSLY want to continue to be a technological leader. Let me give you one example of what I mean. Our oldest technological implement happens to be the telephone book. This is the one part of our communication system that has not changed technologically since the first citywide installation of the telephone.

I am sure you will agree that the alphabetical book is fast becoming obsolete, and there are some very clear signs that it is — the increase in the calls to information in the big cities, cost of books, and the cost of replacing them. Indeed, those who live in most large metropolitan areas, in order to be able to use a directory, have to have detailed geographic local knowledge such as only the chief of detectives can have to use the book altogether.

And now we are getting into a period of Direct Distance Dialing and are committed to making DDD possible within a very few years, which will make it possible for every subscriber in the continental United States to call every other subscriber. Technologically this is no longer a problem, but the alphabetical telephone book surely will become a casualty of this advance.

What good would long distance dialing be to us if we still had to retain our full complement of telephone operators to give people numbers? Actually it would be self-defeat. Here is, therefore, a big product timing job, a technological one, and Commercial people must be prepared to cope with its impact upon our subscribers.

Let me say in conclusion that we are again in a situation in which I think telephone company people haven't been for a long time; namely, the situation of inadvertently thinking of adventuring into the new rather than carrying out a well-tested battle plan — a well-tested strategy in which the problems were known and in which the right behavior was, if not predictable, at least not mysterious.

Today again, as were our predecessors 50 years ago, our company managers are in a situation where vision,

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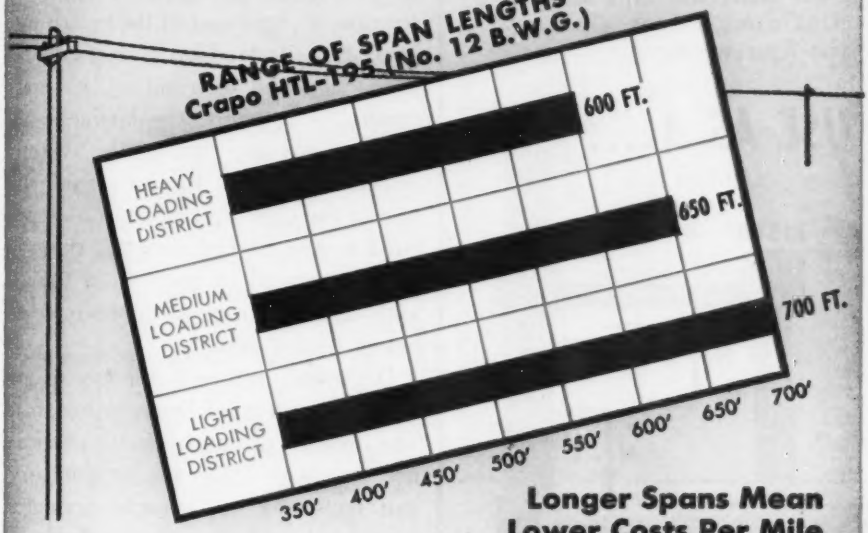

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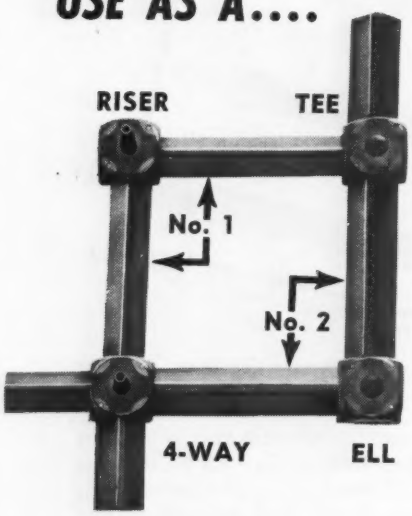

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"Adequate Audit Trails"

(Continued from page 59)

Evaluation Of Internal Control

AN EVALUATION of the system of internal control then is the starting point in the determination of the scope and nature of audit trails to be introduced into the mechanized accounting program. The evaluation requires an appraisal of the entire organization, its product, its methods of production and distribution, its customers — in short, the business. A study of any one part of the system should start with a careful consideration of the plan of organization as related to the studied activity, the reports generated in connection therewith, and the nature of the review inherent in that activity.

Organization then is the key to an effective system of internal control. The division of duties among personnel responsible for the originating and recording of financial transactions has long been recognized. However, this concept of the division of duties, while very important, touches only a small part of the importance of the plan of organization in the development and evaluation of an effective system of internal control.

The internal auditor or systems man is often put off by top management when an attempt is made to study the plan of organization, particularly at the levels where policy decisions are made — or should be made. Often he hits the brick wall of established lines of authority and responsibility that were constructed when the company was small and when operations were uncomplicated by modern production and sales techniques.

It is virtually impossible to install an efficient system utilizing mechanized equipment when the lines of authority are ill defined.

An unfortunate example of this very

USITA Accounting Conference Speaker BRUCE P. OLSON is assistant manager, Ernst & Ernst, Chicago.

thing happened recently to an organization in Chicago. This company installed a small computer and among other things programmed its billing, receivables and inventory control activities on the equipment. The programming included proper machine processing controls and due recognition had been given to the review of input and output data.

Recognition had been given to all factors involved in the establishment of an effective system of internal control — except one — the only one that could not be rectified — the owner's brother. His job title was that of Sales Manager, although in terms of authority he bossed people as if he were the Executive Vice President; in terms of responsibility he sounded off as a minority stockholder sometimes does, and in terms of duties he performed a function equivalent to that of an order writer.

Accounting procedures in effect prior to the introduction of the electronic equipment permitted numerous

variations to take care of brother's whims. Built into the program for the computer were provisions for most of these variations, but the velocity of the equipment generated exceptions at an alarming rate. Brother's special delivery dates, customer favoritism and general meddling in production schedules had amplified the velocity of the exceptions by a hundredfold. He had been able to talk other people into hiding the many exceptions he generated but the machine could not recognize his influence. The programmed audit trails in this instance became the auditor's trial!

Organization is the basic element when we talk about internal control — not just the organization of the accounting department, but the entire organization. It must provide sharp lines of authority — proper delegation of duties and fixed responsibilities. The machines are capable of doing a tremendous amount of work, but people must still do the thinking and directing.

Reporting and Review

WITH THE organizational plan established, consideration can be given to the reporting and review of operations. Reporting in the broad sense is not limited to the financial reports such as balance sheets, income statements, forecasts and budget operations, but also includes reports on sales statistics, operating manpower reports and other data which give the reader a report on some phase of the company's operations or condition. The inclusion of the reporting function as an element of internal control is significant when we come to mechanized accounting. The diversity of reports all *stemming from the same basic information or input data* furnishes us with a check of the input data which can lend considerable strength to the system.

For example, consider a pay roll application. Many reports stem from the worker's report of hours worked or units he has produced — pay roll registers, earnings records, pay checks, manpower reports, direct labor costs added to inventories, indirect labor budget reports, credit units for SUB, group insurance, pay roll taxes, and many other reports.

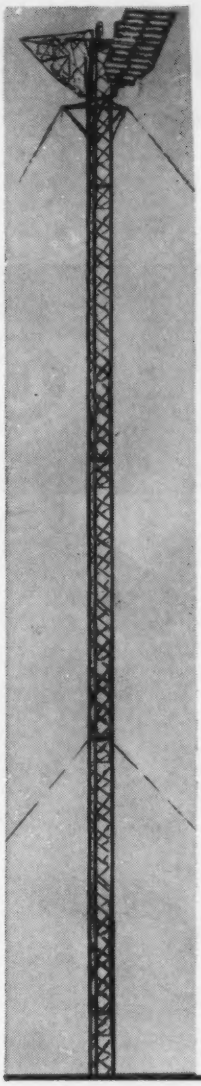
The audit of these reports when prepared from the handposted ledgers was comparatively simple because records were available for visual checking at any point in the process. The preparation of these same reports on mechanized equipment provides no such visual records, and consequently prevents audit checking back along the trail of transactions.

The question of whether or not this trail must be recorded in the mechanized system cannot be determined until after there has been a review of the internal control. The procedures employed in the processing of source data may be unchanged by the introduction of machine accounting, but the system of internal control may well be greatly strengthened by the introduction of this equipment.

Part of this added strength arises from the fact that all reports, such as the afore-mentioned pay roll reports, are prepared from identical data. When these reports were prepared from handposted records, it was not essential (except perhaps for certain government reports) that the data in each report be identical. The cost of reconciling the amounts in such reports was often far greater than the value received from such accuracy and because the reports might vary, however slightly, they lacked a positive element of control.

But reports in a mechanized accounting program must necessarily be prepared from the same data and an error in the source material must be perpetuated in all reports. A fictitious employe added — someone is going to find unaccountable hours or dollars or people in his report. An error in the quantity of production — someone will find negative inventory amounts or other improbable results. Distribution of expense to the wrong account or department — budget variations will signal the error. Control? With proper programming, reports can comprise a significant source of internal check.

The review of operating results is another basic part of the system of internal control. Review in this sense can be anything from a formal examination by independent certified pub-



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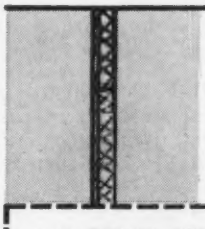

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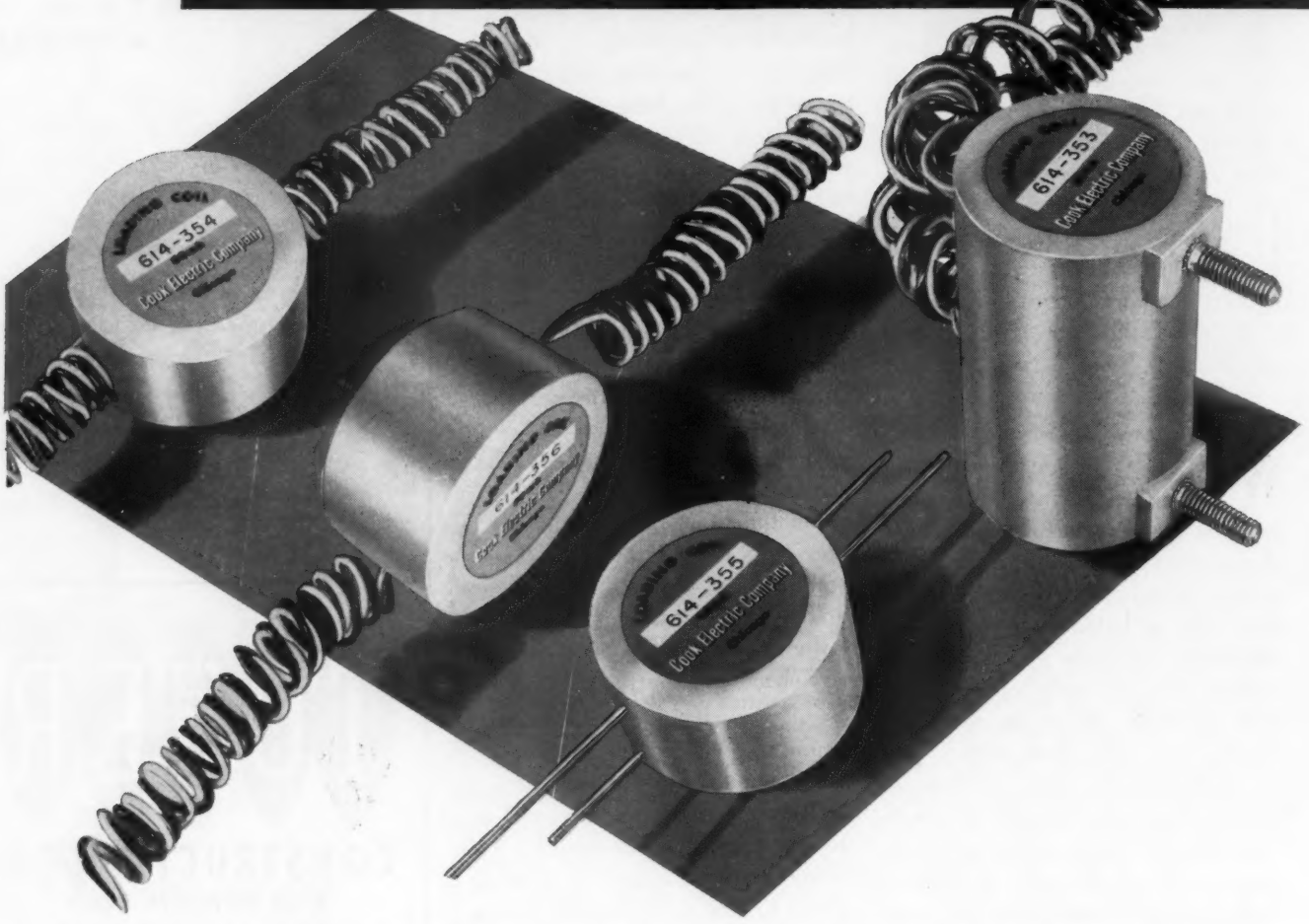

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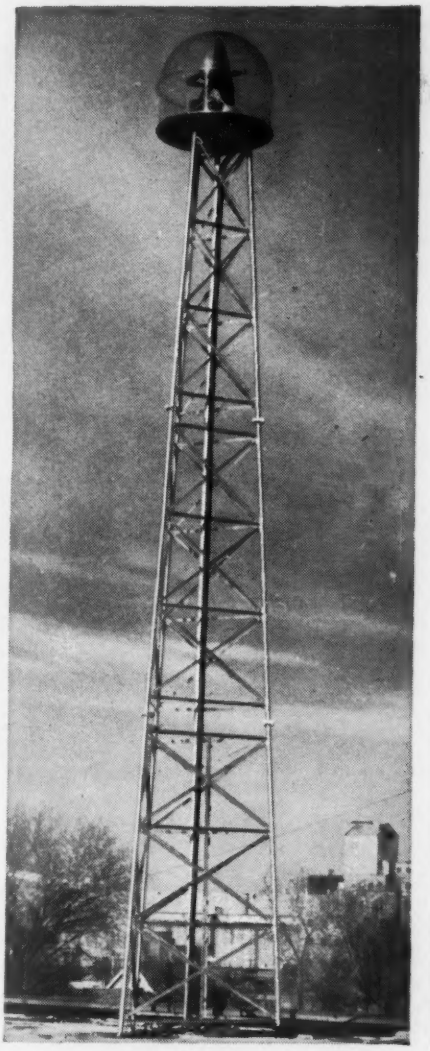

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lic accountants to simply having one person looking over another person's shoulder as an operation is performed.

Review can take the form of pre-review or post-review. The systems man generally has the responsibility for pre-review. It is his job to see that transactions are scheduled to flow through centers and controls which will minimize errors and produce accurate records. With respect to electronic devices, programming becomes an important part of the systems man's review. It is at this point that unauthorized transactions can be vetoed before entering the processing state.

Post-review is generally considered to be the area of the internal auditor. Certainly the auditor must understand the programming of transactions, whether manual, mechanical or electronic, in order to evaluate the finished work, but his principal area of responsibility is the output of the system.

In either the pre-review or the post-review one essential requirement exists. The reviewer must be independent. He must be free of retaliatory action by the person reviewed and he must be free from self-interest or bias. The programmer cannot review his own program; the mechanized accounting department cannot assign one of its own members to review the efforts of that department.

The review of the plan of organization and related reporting and reviewing activities is the proper starting point for the evaluation of the system of internal control. It is not the purpose of this discussion to go into the methods used to establish effective control, such as budgetary controls, standard costs, periodic operation reports, statistical analysis and the dissemination thereof; nor of the importance of training programs to strengthen the system of internal control or the use of protection devices such as cash registers, safes, etc. Each of these topics would require a discussion of its own.

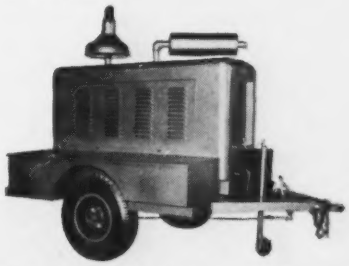
Mechanized accounting may eliminate many of the checking and tracing routines that the auditor has used, but

Please turn to page 104

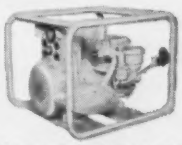
There's VERSATILITY in TELEPHONE SYSTEM SERVICE and Portability with...

U.S.

Complete "versatility" is possible for telephone system service with portable U.S. Versa-Trailer standby emergency power units in sizes from 10 kw to 35 kw capacity.

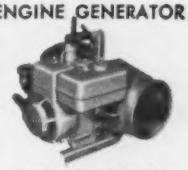


Units provide both single phase power for lights and 3-phase power for other needs. Many exchanges in an area can be served by a single unit.



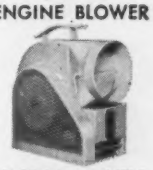
Telephone systems use U.S. portable generating sets for on-the-spot power needs. Sizes 750 watts and larger, air-cooled.

ENGINE GENERATOR



Portable engine blowers provide convenient means of furnishing fresh air to manholes, or for ejecting smoke, fumes, etc.

ENGINE BLOWER



Motor driven blowers like engine driven counterparts, are invaluable for exhausting contaminated air.

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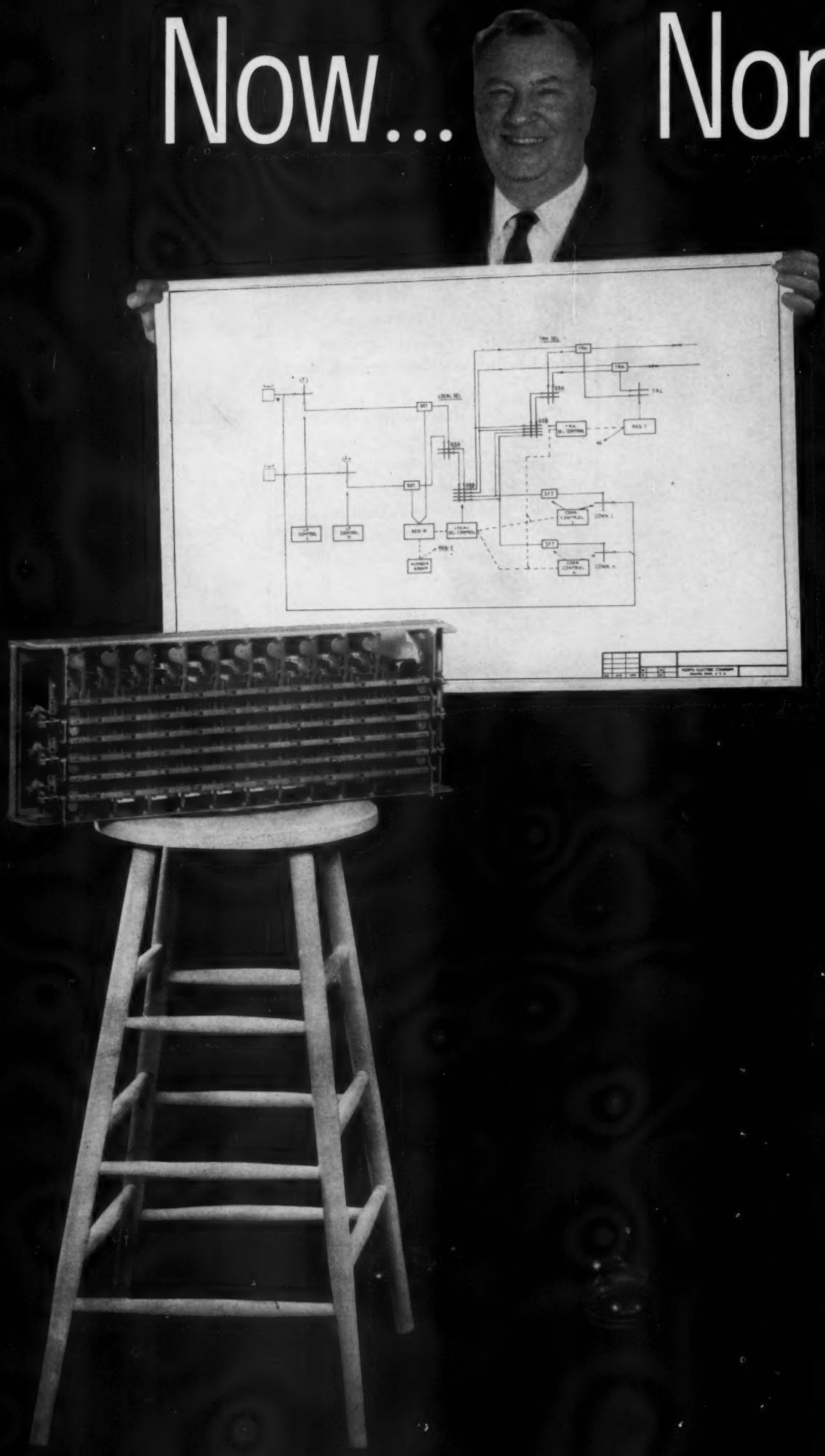

Crossbar for even the smallest exchanges

The new North NX-2 and NX-3 bring to medium and small exchanges the inherent advantages, efficiencies and operating economies which have proven North By-Path Crossbar switching equipment the finest available to the Telephone Industry!

Any exchange, regardless of size, planning cut over to dial operation can now convert to equipment that will outperform anything on the market today—North NX-2 and NX-3 Crossbar.

The development of these two Crossbar systems is another outstanding engineering achievement aimed to strengthen the operations of the Independent operating Telephone Companies—another engineering "first" from

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NORTH

CABLE FAULT LOCATOR

Locates faults in plastic, paper, and rubber insulated cables

Easy to operate
Single dial balancing
Completely illustrated manual
Portable

SHORTS	Accuracy of Three Measurement Varley Method
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it will replace the need for these techniques by the adding of considerable strength to the system of internal control. Improved clerical accuracy, timely reports, and the virtual elimination of record alteration, intentional or accidental, have contributed to this strength. The new concept of internal control and the introduction of integrated electronic and automatic data processing go hand in hand.

Machine Processing Controls

ANOTHER important factor in the determination of the adequacy of audit trails in mechanized accounting, particularly with reference to computer installations, is the strength of the machine processing controls. Since these are highly technical devices, I will attempt only to identify the more commonly used techniques.

Machine processing controls can be divided into two general groupings: built-in checks and program checks.

Built-in checks are incorporated in the machine by the manufacturer to monitor the transfer of data with the system. For example:

Parity checks are used to monitor the transfers of numbers from machine to tape, tape to machine, or infrequently internal transfers within the computer. An extra binary bit is added to or omitted from each character so as to make an even (or odd, depending upon the equipment) number of bits. An attempt to transfer an odd (or even as the case may be) number of bits will either stop the machine or throw it into an error routine.

Duplicate circuitry will provide the means for independently processing the same functions and automatically cross checking results. Repeated arithmetic checks will perform a similar function on an automatic basis.

There are other checks in use which similarly employ the redundancy feature.

Program checks are introduced into the machine accounting program and may include:

Limit checks which require a result to fall between predetermined amounts.

Please turn to page 106

THE *New* LORAIN BAT-TAP

another FIRST from LORAIN!

the only device delivering 24 volts DC

with full efficiency, full battery protection

NO POWER LOSS

Voltage reduction by CEMF cells or resistors wastes half the power used. Bat-Tap prevents this loss.

PROTECTS BATTERY

Voltage reduction by tapping the battery causes uneven charging and discharging of cells, unless an extra 24-volt charger is used on the cells involved. Bat-Tap protects your battery, needs no extra equipment.

NO MOVING PARTS

The Lorain Bat-Tap uses a new transistorized inductor arrangement combined with silicon diodes. 48-volt DC is first converted to AC, then to 24-volt DC in a simple, foolproof circuit.

SAFE ON OVERLOADS

Bat-Tap easily withstands intermittent overloads up to 30%.

FULL EFFICIENCY

Efficiencies are as high as 80 to 89% from 25% of rating to 30% overload. Efficiency at full load is 87.5%.

RATINGS

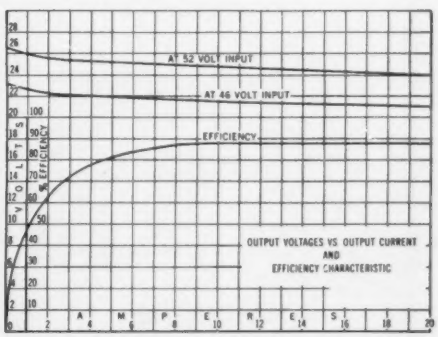
Model QB15A

Input: 44-52 volts, 0.5 ampere no load, 8 amperes 400 watts full load.

Output: 21-27 volts at full load of 15 amperes, 350 watts.

Regulation: 1.5 volt drop from 1 ampere to 15-ampere load.

Filtered input and output (output filtered to 2 millivolts).



EASY INSTALLATION

Bat-Tap requires only simple external connection of input and output leads. Fits 19″ relay rack. Height 6¾″. Depth 9¾″. Weight 32 lbs.

ZERO MAINTENANCE

The Lorain Bat-Tap never needs attention. There is nothing to wear out or need adjustment. Install it and you can forget about your 24-volt power supply.

POWER EQUIPMENT FOR COMMUNICATIONS AND INDUSTRY

our equipment is sold through leading telephone distributors

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LORAIN *Products Corporation*

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Nothing Beats It For Fast, Low Cost Digging

Here's a front and rear view of the more powerful, compact 4T Vermeer Pow - R - Ditcher in action. If you are looking for a low cost, rugged, time - saving ditcher, take a look at the 4T before you buy.

Vermeer Model 4T POW-R-DITCHER

This rugged, self - propelled Pow - R - Ditcher is only 48" wide, 6' high and 13' long and can be transported in a pickup truck. A "midget" ditcher that is ideal for laying gas, water and narrow service lines. The 4T is highly maneuverable — digs 6" to 14" wide and down to 4½' deep.

WRITE FOR COMPLETE INFORMATION, LITERATURE AND LOW PRICES ON THE COMPLETE POW-R-DITCHER LINE.

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Thornhill Publishing Company

A Division of
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Production — Distribution — Collecting
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Record counts which compare the number of items processed with a predetermined total.

Hash totals which have no significance in themselves, such as the sum of employe clock numbers, but serve as a control total.

Reasonable checks which are similar to limit checks except that the limits are variable depending upon one or more other factors.

Sequence checks which insure that a file is in correct sequence.

Manual intervention control which causes a record to be made on a separate tape whenever the machine is stopped either by the console operator or automatically. The tape, sometimes called an audit tape, may be made inaccessible to the machine operators.

There are many other checks available to the programmer for use in checking the clerical accuracy of the system.

Audit Trails

AFTER, and only after, a proper evaluation of internal control has been made and an understanding of the machine processing controls gained can consideration be given to the nature and extent of audit trails.

Audit trails may take the form of print outs or internally stored trails. Both can be costly if not thoughtfully applied.

A complete trail of printed information would provide the means to audit every transaction, as was formerly possible with the manual systems. But this possibility by no means furnishes strength to the system of internal control nor provides a logical method of audit.

Too often the printing of data may be introduced into the program at intermediate stages of the data processing without adequate justification. After the system has been installed and various listings are generated the question arises — "who wanted all these lists?" The auditor is often blamed. Yet, the auditor's principal tool is the test — he may only want to examine 2% or 3% of the items in any listing.

Obviously it is a waste of machine time to generate a listing that is put

POWER-INSTALLED SCREW ANCHORS

average 5 to 8 man-minutes for complete installation

Latest advance in anchoring technique speeds line construction . . . realizes greater value from investment in hole-boring equipment

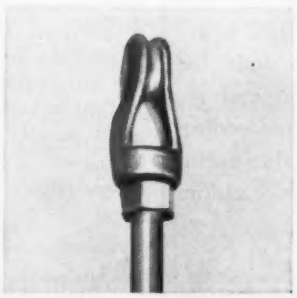
If your company uses power hole-digging equipment for line construction, you can now use that equipment to install the new line of Chance Screw Anchors.

Chance Power-Installed Screw Anchors, ranging from 78 to 176 square inches in area, can be speedily installed in all types of soil, except extremely rocky soil. Your present power boring equipment, regardless of type, can be easily adapted to power anchor installation. Only one new part is needed—the wrench shown below. This wrench transmits torque from the power equipment directly to the specially designed hub on the anchor helix. Since the anchor rod is not subjected to torque, it only has to be heavy enough to support the guy load—a cost-saving factor.

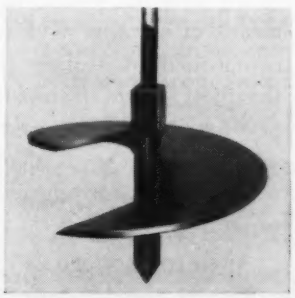
Installation procedure is extremely simple. *Step one* is to remove the Thimbleye or Twineye nut and slide wrench on the anchor. *Step two* is to fasten the wrench to the "Kelly Bar" of the power-digger, or, to fasten the wrench on the pilot bit of the auger using an adapter. *Step three* is to drive the anchor with the power equipment. *Step four* is to release the wrench from the anchor and retrieve it from the ground. (The spring-loaded "dogs" that lock rod in position are easy to release.) *Step five* is simply replacing the Thimbleye on the end of the rod—your anchor is ready for hooking up the guy wire.

These five steps are accomplished in a matter of minutes. Repeated time tests in various types of soil prove that Power-Installed Screw Anchors averaged only 5 to 8 man-minutes for a complete installation *—from the time the equipment was moved into position until the anchor was ready for the guy!*

THE ONLY PART NEEDED is this special wrench. (Diagram shows how it fits the anchor.) Wrenches are made to fit all popular makes of earth-borers.



THIMBLEYE and TWINEYE guy-wire nuts are available. They distribute pulling stresses uniformly and keep guy wire from spreading, kinking, or bending.



SHARP CUTTING HELIX of high strength structural steel is tapered to minimize earth disturbance. Special hub fits lower part of wrench.

CA59-23A

PULL TESTS PROVE HOLDING POWER

During the engineering and development stages of these Power-Installed Anchors, several hundred tests were made to check the anchoring dependability of power-installed screw anchors. Each anchor was pulled by a mobile testing unit to determine maximum holding power. Complete test data is given in Bulletin 868. Address your Bulletin requests to...

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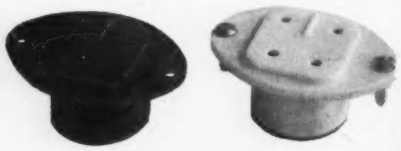
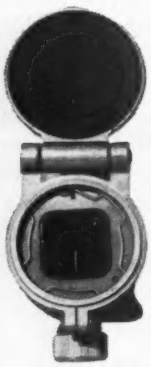
WHAT'S NEW AT SUTTLE

TOP VALUES



New Flush Mounting Wall Jack

In brown or ivory plastic, the SE493A jack can be flush mounted directly in molding or wall. Four (4) spring tensioned jack holes accept standard SE283B 4-prong plug. Can be used with SE19B plate, also in ivory or brown, for attractive modern flush installation for 2, 3 or 4 wire service requirements. No conduit box necessary. SE493A $1.30 each. SE19B Plate, $.30 ea. Specify brown or ivory.



NEW Outdoor Weatherproof Jack Boosts Revenues!

Subscriber demands for outdoor, backyard, or patio telephone service are growing fast. The new SE16151 Outdoor Weatherproof Jacks from SUTTLE fills the bill for every outdoor use. The non-corrosive, waterproof, aluminum receptacle houses the SE-493A jack (above). This new jack makes an excellent extension sale-revenue booster. Another SUTTLE *quality* product at low cost. Order now from SUTTLE or your distributor.
Price $6.50 ea.

SUTTLE EQUIPMENT CORP.

401 N. 15th St., Lawrenceville, Ill.
Phone: Lawrenceville 782

135 S. La Salle St., Chicago 3, Ill.
Phone: DEarborn 2-3108

to such limited use. A listing, while furnishing an excellent audit trail, acts as a drastic brake on the orderly processing of data, loads the output facilities of the equipment, and creates a very real storage or filing problem.

There are alternatives to the complete print-outs which in many instances will provide very adequate audit trails. The data actually printed out may be limited to variations from a predetermined norm. For example, in a pay roll application, the listing could include only the employes whose average hourly earnings exceeded a certain dollar amount which could be varied by job classification. This is an adaptation of the programmer's machine processing control (limit check or reasonable check) with limits set within the bound of reason but of sufficient variation from a norm to be of interest to the auditor.

The preparation of a tape reproduction of the data being transferred at a given point in the process is an alternative to the printed list. A listing can be prepared from the tape reproduction at some later date if requested by the auditor. Consideration might also be given, in some instances, to relying upon the reprocessing of input data as the most expedient means of furnishing an audit trail. If the print-out is used in any form, it will be expensive. I suggest that in the long run it may well be less expensive to prepare a listing of selected accounts for audit purposes from the original source data than it would be to program a print-out into the regular routine.

In addition to the creation of audit trails by the print-out method or variations thereof, it may be possible to back-trail at any point in the process to the original source material. One means of creating a back trail is accomplished by storing the code for the most recent transaction and reproducing it in the next succeeding output. This is particularly useful when data is introduced in random order.

Audit trails which can thus be programmed should more than satisfy the most finicky auditor. The true problem underlying the creation of adequate audit trails does not relate

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to the capability of producing the trails, but rather to limiting the trails to only those which will serve a useful audit purpose. Generally, the requirements of management in respect of printed information will furnish the auditor with sufficient data to permit a post-review of transactions.

Adequate audit trails, to the auditor, are only those which are required to compensate for weaknesses in the system of internal control or take the place of machine processing controls. The introduction of machine accounting, whether electronic or mechanical, requires a reappraisal of the system of internal control — only then may the adequacy of audit trails in the data processing routine be determined. — *Bruce P. Olson.*

"Number Services"

(Continued from page 55)

which we point out the merits of area codes on stationery, bill heads, letterheads, cards, etc.

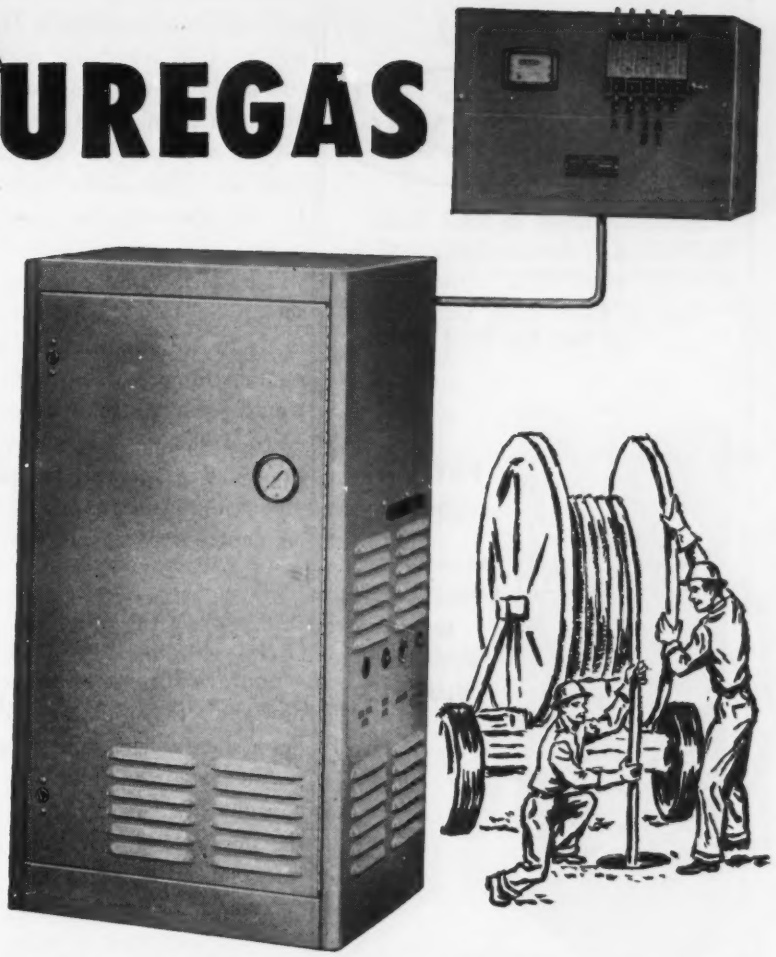
Some of you may have already seen some of the Bell System directories that include the area code in foreign area listings. (*Figure Two.*) New York City is one of these directories where foreign area listings are shown as "201 GE 8-9970" instead of the old method where we said, "Ask Operator for Passaic, New Jersey, GE 8-9970." Besides giving the customer the telephone number in the most usable form it saves considerable directory space, saves operator work time, provides faster service and promotes the use of area codes.

Directory Instructions

WE ARE ALSO taking a close look at the quality of the job we are doing in the introductory pages in our telephone directories. These directory pages provide instruction material that is always at hand and in some cases is the only one that is put in the customer's hands. These pages are widely used as a source of information on many items concerning telephone usage and telephone service.

We are planning to issue a suggested directory introductory page

PEC PUREGAS



PRESSURIZED DRY AIR

stops cable moisture

Under ground—Above ground, pressurized dry air keeps moisture out of cables and keeps conductors dry. PUREGAS equipment automatically maintains dry air pressure all along the line.

Constant air pressure stops water and corrosive fumes from penetrating cable sheath breaks, as PUREGAS equipment automatically responds by increasing air flow in the affected cable. In addition to this advantage, dry air prevents condensation from forming inside the cable regardless of outside air temperature.

PUREGAS equipment quickly recovers its investment by adding to cable life, and reducing maintenance costs while protecting circuit continuity. This is why more and more cable networks throughout the country are being pressurized with PUREGAS dry air equipment.

To increase subscriber satisfaction and cut operating costs, investigate PUREGAS pressurized dry air. Send for new technical information on "Why cables should be pressurized."

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578 OAK STREET
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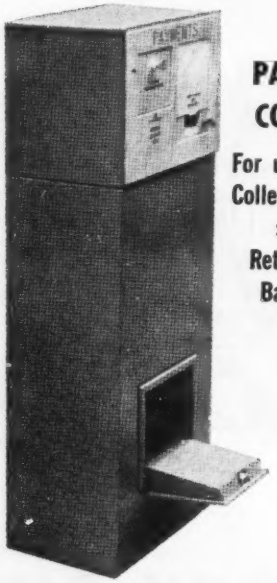
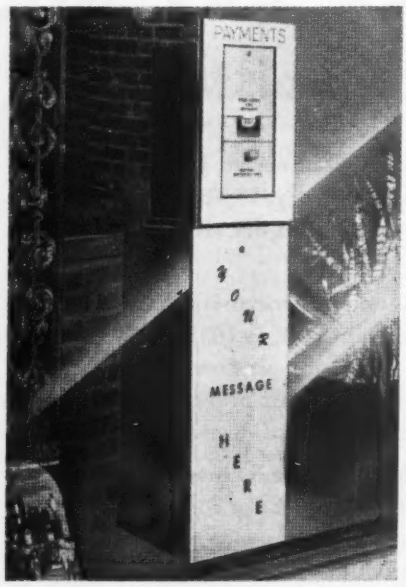
There is a
DROPOSITORY
Specifically Suited to YOUR Needs!
COMPLETE *Self-Service* EQUIPMENT for
PAYMENTS or DEPOSITS *"After Hours"*
Used by Public Utility Companies
All Over the World



PAYMENT COUNTER
For use by your Collecting Agents such as Retail Stores, Banks, etc.



Economical PLATE GLASS INSTALLATION
(May Be Installed In Walls)

THE MOSLER DROPOSITORY CORPORATION
GRANDVIEW, MO.
Telephone: (Kansas City Exchange)
SOuth 1-8911

format and content which we expect will find wide acceptance. These pages will explain telephone usage to the customers in easy to read language and in a format that we feel is easy to use and which conforms to the best principles of instruction layout. In addition some uniformity in sequence and arrangement of material will be of advantage in our transient society of today where a person is likely to use one directory today and another tomorrow. For this reason it would seem desirable for this to receive Industry-wide attention. Our suggested pages will be made available for consideration by the Independent companies.

Area Information

THE DDD customer who has to secure a distant telephone number now dials the operator and tells her he wishes a telephone number in a particular distant city. The operator consults her routing information for the proper code for the distant city information bureau and establishes connection. After obtaining the number the customer secures the area code from the distant information operator, from his operator or from a list, and then dials his call. This procedure is awkward, cumbersome and time consuming.

It seemed reasonable that if a customer could dial an area code and number to reach the telephone in a distant area, that some means could be devised to dial that area code and a special number to reach distant information. This special number must have seven digits to conform to the requirements of Direct Distance Dialing.

A decision was made earlier this year to use the number 555-1212 and to establish it as a universal toll information number in each of the numbering plan areas. This means that eventually by dialing the area code, obtained from a list or from his operator, and then this number, a customer would be able to obtain any telephone number in any numbering plan area that he can dial.

You may have read in the press that the Connecticut subscribers were informed that they could reach information in New York City by dialing the access code 112 followed by 212-555-1212. This is the first major public notice of the availability of distant information by dialing the area code and universal toll information number. This is a rapid and easy way to obtain numbers in distant places that we feel customers will readily adapt themselves to and use.

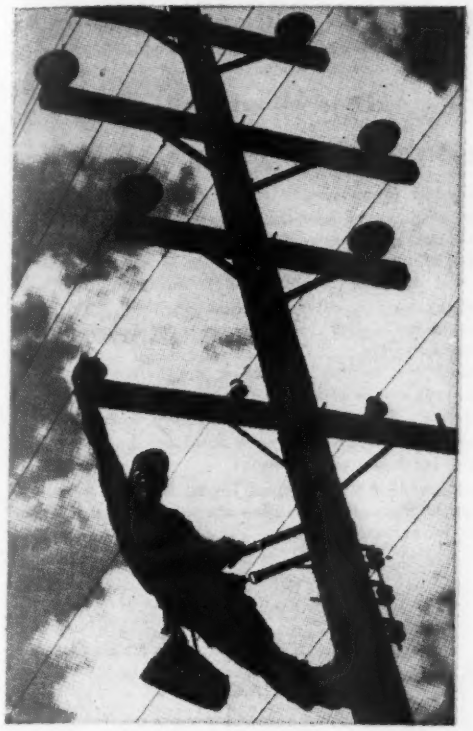
USITA Eng. Conference Speaker RICHARD A. MATHEWS, numbering services planning engineer, AT&T, New York City.

At the present time two areas, Delaware (302) and New York City (212), have been set up so that distant DDD customers may reach information for the entire numbering plan area by dialing the area code and this universal toll information number. Many more areas are well along in their planning to establish similar area information bureaus.

Setting up these NPA information bureaus is a major task in some locations as you can well realize. There are two broad approaches that can be followed in setting up these bureaus. First, of course, is the arrangement established in Delaware and New York where all information records and daily addenda for the area are brought together at one information bureau.

This arrangement can only be followed in some of the geographically smaller areas where transportation is not a controlling factor. The second alternative is to establish most of the main records and some of the more frequently called daily addenda at a centralized location and then trunk

How can you string telephone lines faster?



Use USS Tiger Brand Amertel 195

Because the high-tensile characteristics of Amertel 195 make possible longer spans than other telephone wires, work is speeded up. There are fewer holes to dig, fewer poles to set, less hardware to install. Mile after mile, lines strung with this bonus wire go up faster—more economically.

The use of USS Amertel 195 pays off in other ways:

- **Amertel 195 has extra low resistivity, resulting in better voice transmission at relatively high frequencies.**
- **Amertel 195 is easy and economical to string over rivers and gullies.**
- **Severe weather conditions will not damage it. Heavy ice may weight it down, but will not break it.**
- **Existing rural power poles may be used to string telephone lines without need for additional supporting poles.**

For more information, write to American Steel & Wire, Dept. 9179 Rockefeller Bldg., Cleveland 13, Ohio. We'll gladly send you our new, free booklet on Tiger Brand Amertel 195.

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out from the information bureau to a local information office for those less frequently called records that are not centralized. Of course, the frequency of calling out should be held to a minimum, to avoid increasing costs by tying up two operators and to avoid slowing down service. This requires the ability at the information position to out-trunk to a long distance point within the numbering plan area where up-to-date information can be obtained. On our present equipment this cannot be done but it is being considered for future information switchboards.

As an interim arrangement it may be desirable to route all calls for the area information operator to an inward board in the terminating numbering plan area where the operator would challenge with the question "Alabama information, which city are you calling please?" The call would then be trunked from the inward board to the local information bureau handling the records for the city desired.

Any of these alternatives can be used and probably will be tried to establish area information bureaus as soon as possible. The cooperation of Independent companies in maintaining up-to-date records will be important in furnishing a top grade information service.

Micro Storage Of Records

ONE OF THE new devices that will aid materially in reducing the bulk problem, in lowering the cost of handling records and in the centralization of records, is the new microfilm position that we are developing in connection with a leading optical firm. Efforts toward microfilming information records were largely brought about by the bulk problems that have been created in areas of heavy telephone concentration such as New York City, North Jersey and Los Angeles.

For example, the New York positions contain 95 lbs. of information records in which there are 5 million listings. The North Jersey positions contain even more records. As our thinking developed and our plan progressed, it became evident that microfilm storage of information records would also be useful for centralizing records for area information bureaus.

The use of microfilm will allow the storage, in a relatively small space, of 10 million listings, which we see as a practical limit of the existing numbering plan for an NPA. It would also enable us to take records in many forms such as rotary files or different size directories and place them all in one easy-to-handle microfilm form for operators' records. In our preliminary design of this type of equipment we are also planning to make it possible for the operator to trunk out to other information positions for daily change data on some main records or for some of the main records for less frequently called points in the numbering area.

A trial using a mock-up of this position (*Figure Three*) was made in Brooklyn with the operator following an actual call being handled in another regular position. Studies and comparisons of operating work time indicate that the microfilm position

Presenting now the

New and Improved Murphy Silent Buzzer

For 2-man testing to identify cable pairs in new or working cables — without interference — even on busy lines Models SBT-2 and SBR-2 (all sets shipped after June 1, 1959)

SBT-2

SBR-2

- Eliminates monitoring for busy lines
- Faster testing to identify pairs
- Super-hetrodyne circuit, battery powered
- Never disturbs any line
- Loud clear two-tone signal to splicer and helper
- Compact and light, 3 x 4 x 5 inches

1. Increased power for the Transmitter for the longest loaded cables — without interference.
2. Increased Receiver sensitivity — now 7 transistors — for efficient pick-up with the capacity probe.
3. Smoother and less critical volume control, no overloading of early stages on shorter cable runs.
4. Spare probe tip holder moved to the top of each case instead of atttaching to the cord plugs.
5. Improved capacity probe, 10 times greater pick-up, can be "hooked" onto proper pair with one hand and pair moved and held away from other pairs for positive identification.
6. Two slide switches have been replaced by a single rotary switch, for simpler and more dependable operation.
7. Instructions included for a simple connection on the Receiver to convert it to a source of low frequency tone — so that the splicer can pick out a spare pair for a talking pair and the helper can locate it in the central office with a monitoring set.
8. A convenient and durable carrying case is now available for carrying the silent buzzer, all cords, batteries, the Field Test Board and the Speed Tester for maximum protection during storage and transportation.
9. In use on a busy line, neither the splicer nor helper can hear any part of the subscriber's conversation.
10. Transmitter uses only 5 ma from a 4½ V battery. Receiver uses only 6 ma from a 4½ V battery, or a total for both of only 49.5 milliwatts — from low cost batteries.

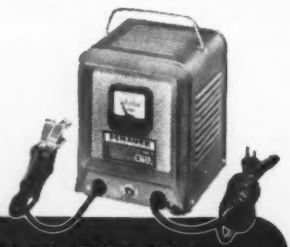
Net price $194.00 per pair — f.o.b. Houston, Texas. Shipping schedule — 90 days. Write for additional information on this and other telephone test equipment manufactured by

ELECTRONIC RESEARCH DEVELOPMENT MANUFACTURE

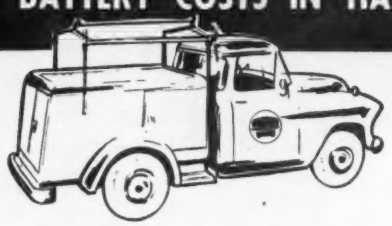
MURPHY ENGINEERING LABORATORIES, Inc.

4419 TULSA HOUSTON 24, TEX.

SCHAUER CHARGERS



CUT YOUR SERVICE TRUCK BATTERY COSTS IN HALF!



It's like money in the bank when you put Schauer Battery Chargers to work in your garages. You'll keep your service car and truck batteries always at peak charge, ready for instant starts. You'll cut dead battery delays to zero . . . get far longer battery life . . . save real money on battery replacements. There's an economical, dependable Schauer Charger for every need . . . quality-built by the manufacturer of Schauer (Electrox) Rectifiers for the Telephone Industry! Write for Bulletin No. 2492.

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Chicago 26, Illinois ....., 1959

Gentlemen: I am enclosing $ covering binders @ $4.00 each postpaid

Name .....

Company .....

Address .....

FIGURE THREE: — Studies and comparisons of operating time indicate the microfilm position can be operated at least as fast as book record position.

can be operated at least as fast as the book record position.

Interviews with the people who took part in the study indicated an overwhelming acceptance of this type of record and position. With these results to support us we are going ahead with development of a full scale operative model that we expect to have working by the fall of 1960. From this trial we expect to learn much more, not only about the operation of microfilm positions, but about the technical problems in producing records that can be microfilmed, microfilming these records and making them available for operating room use.

Numbering Plans

THE PRESENT telephone numbering plan of two letters of a central office name plus five numerals is in effect in about 83% of the telephones in the United States, and as you know seven digit telephone numbers is a requirement for Direct Distance Dialing. Since this was introduced, customers have increasingly used just the two letters of the C. O. name. Look at advertising, signs, or television and you find that two letters are being used instead of the full name.

About 75% of the Bell System directories use two letters and many of the Independents' directories are also using just two letters. This saves space, but in addition, over a period of time we have come to the realization that there are potential sources of inaccuracy or misunderstandings

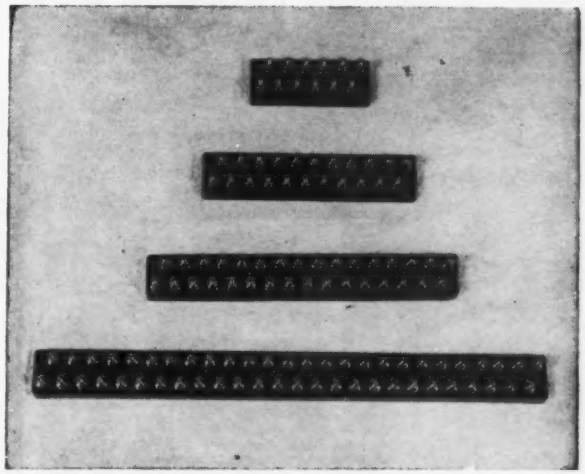
Please turn to page 116

THE SIEMON CO.

WATERTOWN, CONN.

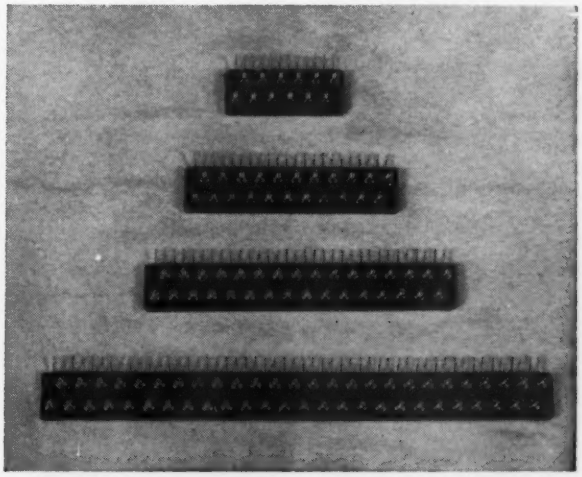
Manufacturers of

SIEMON CONNECTING BLOCKS



No.	No. Of Connectors	Length of Base Inches
30-A	6	4 3/16
30-B	11	7 5/16
30-C	16	10 7/16
30-D	26	16 11/16

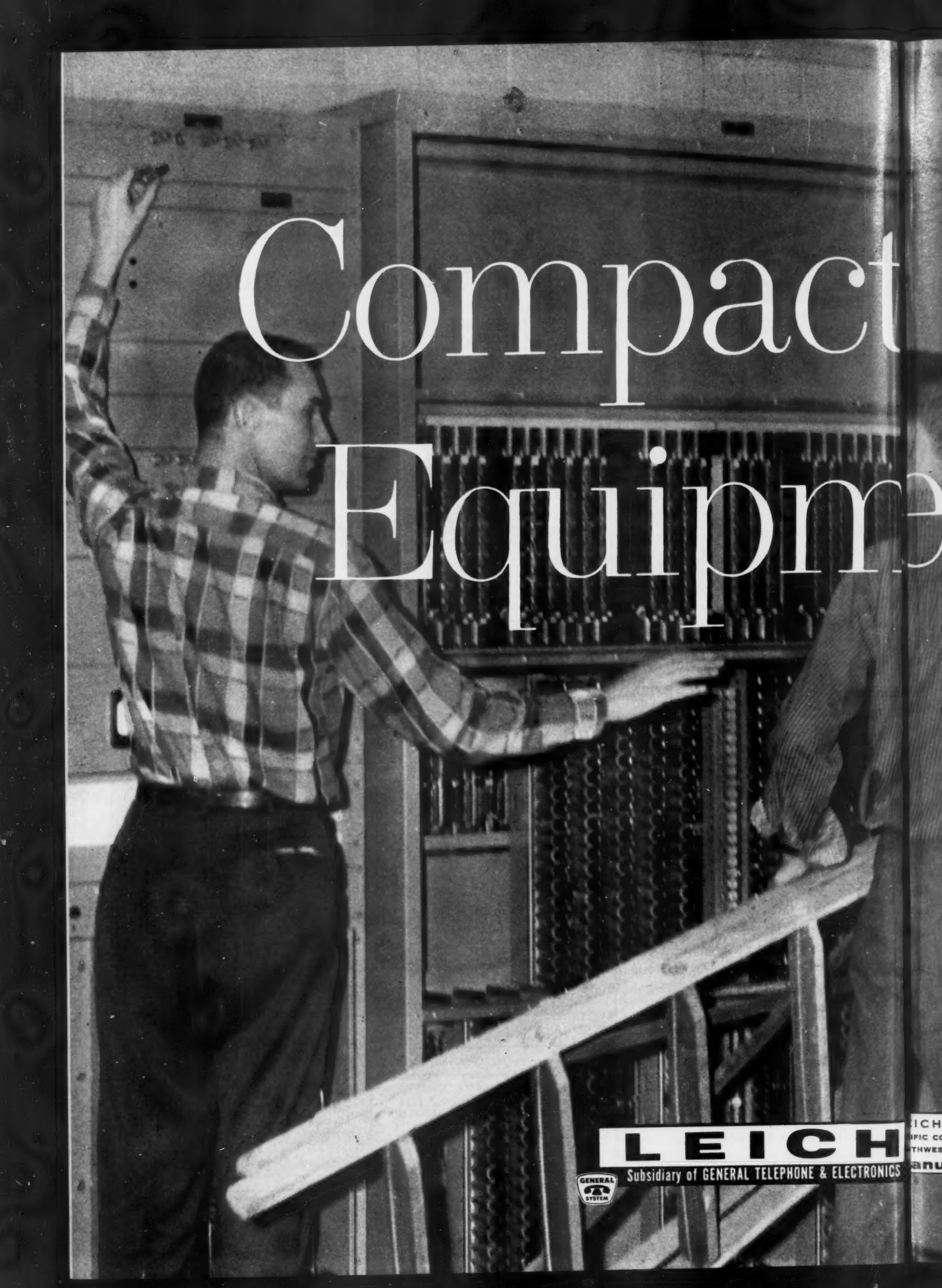
The above Connecting Blocks have two binding posts on each connector. Moulded Plastic Base. Width 1½ in. Thickness ½". Maufactured for telephone and all other lower voltage applications. Further detailed specifications, prints and prices furnished on request.



No.	No. Of Connectors	Length of Base Inches
31-A	6 pair	4 3/16
31-B	11 pair	7 5/16
31-C	16 pair	10 7/16
31-D	26 pair	16 11/16

Each Connector has one binding post and one soldering terminal, brought out on the side. Moulded Plastic Base. Width 1½ in. Thickness ½". Manufactured for telephone and all other lower voltage applications. Further detailed specifications, prints and prices furnished on request.

Sold Only Through Authorized Distributors


Compact
Equipme
LEICH
Subsidiary of GENERAL TELEPHONE & ELECTRONICS
GENERAL SYSTEM

MONEY-SAVING FEATURES OF THE LEICH DIAL SYSTEM

saves on building costs . . . simplifies maintenance

When choosing a dial system it's important to consider the cost of your exchange building, as well as the cost of the switching equipment. Leich's Dial System is not only economical to install and maintain, but also saves you money by occupying a minimum of floor space.

In fact, the Leich Dial System requires less space than practically all other types of dial switching equipment. It has a uniform height of 89 inches, which makes an 8-foot ceiling adequate regardless of the size of the installation. What's more, all the equipment is accessible to your maintenance man without a ladder.

To add 100 lines to a Leich Dial System it is necessary to add only one switchboard bay. Sliding Plexiglas doors make it possible for switchboard bays to be close together yet provide plenty of space for working and walking around the equipment.

A Leich sales engineer is at your service. There's no obligation. Write for details.

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EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO
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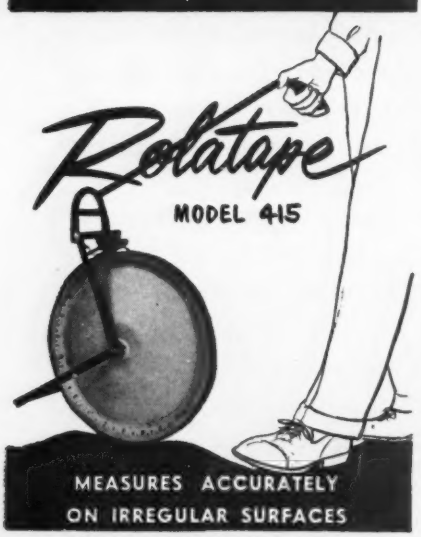
anufacturers of telephones, switchboards and related apparatus since 1907

It's New!

NOW-AT LAST A MEASURING WHEEL THAT MEASURES ACCURATELY- TO A FRACTION OF AN INCH!

Rolatape's amazing new Model 415 meets all your measuring needs — measuring quickly and surely over the most uneven and irregular terrain with no risk of human error. This time-saving instrument is calibrated to measure accurately in full view of operator as it is rolled along, giving measurements in inches (to ½ inch) on one side of measuring wheel, and tenths of a foot (to .5 of a foot) on the other. Sturdy and lightwight, it is equipped with automatic brake and built-in stand. Handle folds compactly. See one at your dealer's today.



MEASURES ACCURATELY ON IRREGULAR SURFACES

SEND TODAY FOR FULL DETAILS

ROLATAPE Inc.
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Send me free details on ROLATAPE:

NAME_____

FIRM_____

ADDRESS_____

CITY, STATE_____

from use of central office names.

Some names like Dewey and Fieldbrook have a misleading vowel sound in the first syllable. Some like Yukon and Endicott seem to begin with the second letter. Others like Kirby, Murdock and Mercury use different second letters for identical sounds.

Many central office names are completely unfamiliar to a great body of telephone users who must rely upon the sound of the name to arrive at a spelling. With the advent of Direct Distance Dialing, the problems involved with the spelling and phonetics of unfamiliar central office names are rapidly increasing.

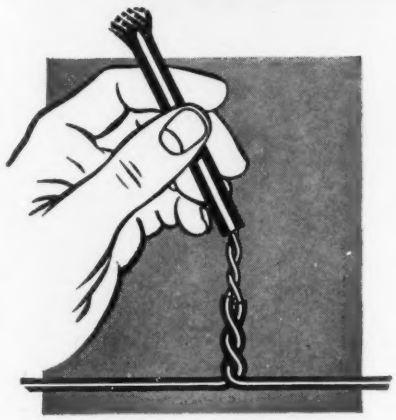
There appears to be a potential hazard in the continued use of central office names. Some experimentation has been done in the Bell System to encourage operators to quote two letters to customers instead of the central office name. This appears to have some merit since it gives the customer only what he needs in order to dial. It eliminates the need to supply unfamiliar names, and cuts down unnecessary repetitions between operators and customers caused by the use of unfamiliar or difficult-to-spell names.

In fact with this arrangement the letters selected need not be associated with any name. However, the phonetic difficulties caused by the use of letters will not be entirely eliminated until a system of all numerals is adopted.

We are planning to make extensions in the use of All Numeral Numbering in and around Omaha, Nebraska. Seven digit All Numeral Numbering is now in service successfully in Wichita Falls, Texas, and we feel that its acceptance and performance there, in addition to other advantages, make its extension desirable. All Numeral Numbering will make available more central office codes than are now available on a central office name basis and will permit the retention of larger numbering plan areas, thus allowing customers to reach more telephones on a minimum of digits.

It will eliminate the need for translation from numerals to letters for billing purposes and simplifies the

Superior's "Super-Splice"® is safe and sure!



"Super-Splice" makes splices waterproof . . . from inside out!

Sealed at one end, this plastic splice sleeve is filled with an insulating and waterproofing compound.*

Economical "Super-Splice," a Superior exclusive, makes the splice permanently as good as the cable . . . yet it can be re-entered easily. The compound never hardens or oozes out no matter what the temperature.

Prevent leakage currents and breakdowns in the presence of moisture...good for 25,000 v.d.c. Order "Super-Splice" NOW!

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"Super-Splice" is available for use with straight, butt or bridge splices.

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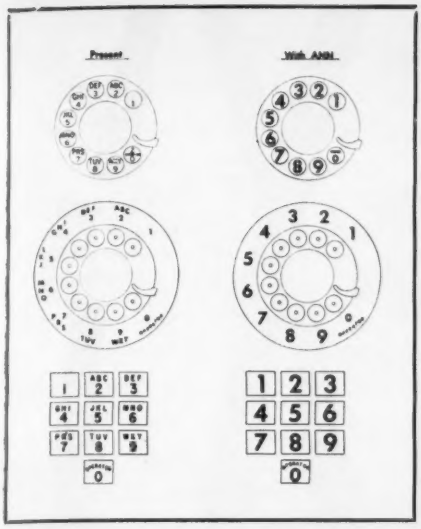


FIGURE FOUR: — On DDD calls with an area code it is easier to dial entirely on an all-numeral basis than it is to shift from numerals to letters and back to numerals.

recording and reading of mark sense tickets. On DDD calls with an area code we feel it is easier to dial entirely on an all-numeral basis than it is to shift from numerals to letters and back to numerals again. It would also eventually improve the legibility of dials or pushbuttons since letters could be removed and numbers made bigger. (*Figure Four.*) Here too, an all numeral dial would conform to requirements for international dialing. All Numeral Numbering also avoids the occasional customer objection to a selected name.

If it is decided to go to All Numeral Numbering, we visualize an orderly conversion of existing 2L-5N cities by starting assignment of the new type numbers on all inward movement. The dial number plates would, of course, continue to have letters and numerals until such time as the nation-wide status would indicate the desirability of all-numeral plates.

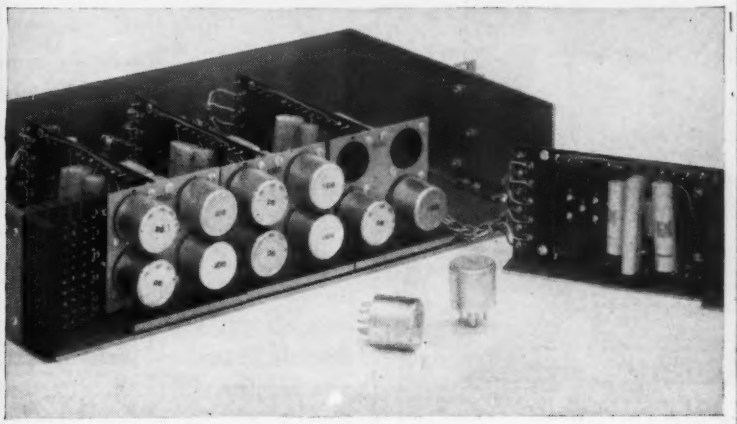
For some time directories would contain numbers of both types, but after several years, numbers of the new type would predominate. At an appropriate time, coincident with a new directory issue, the remaining numbers and dial number cards could then be changed. Arrangements could be made so that calls placed by either the old or new number would be completed.

This conversion method has important service and cost advantages. The

KELLOGG

K-840

4-wire terminating equipment



Units can be extended from the shelf without interrupting service.

SAVES 75% IN SPACE!

Kellogg's new *miniaturized* K-840 meets the high requirements of high grade toll circuits – and takes up only ¼ the space of older equipment!

In addition, the K-840 has these other features:

- Permits operation of signaling trunk circuits without affecting the balance of associated voice circuits.
- Ideal for use in two-wire office where a 27 db balance or better is required.
- Provides nearly constant impedance across the voice frequency band.
- Fine and coarse attenuation adjustments.
- Four units occupy only 3½" of vertical space on a 19" rack.

Your Kellogg sales representative will be glad to explain all the advantages of this low cost versatile equipment.

KELLOGG Communications Division of IT&T
CHICAGO, ILLINOIS

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue Chicago 38, Ill. Communications division of International Telephone and Telegraph Corporation

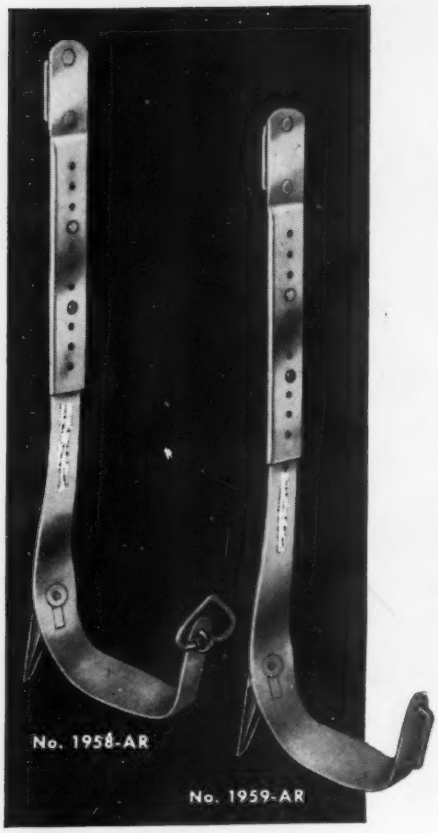
For complete list of offices see pages 28-29.

customer will not lose any incoming calls due to number change. An ample period is available to notify customers of the proposed change so that customer expense in changing stationery and other printed material is minimized. No central office equipment expense is involved. Directory expense is minimized since the final change would not be scheduled until most customers were on the new basis.

Many of the world's telephones operate successfully on an all numeral basis today and some that use letters are converting to all numerals, notably Australia. There is much to recommend All Numeral Numbering.

Now a word about codes. With the present numbering plan only about 540 of the theoretical maximum of 640 central office codes are usable and the X0X and X1X area codes are limited to 152. 115 of these area codes have already been assigned. New and extended services such as extended area service, P. B. X. direct inward dialing, mobile service, personal signalling and others are placing increased demands on the number of available codes. So a plan must be developed for getting more area and central office codes. We feel that the plan adopted must provide a substantial increase in the number of area codes and as many more central office codes as possible. Several such plans are now being studied, and we will keep Mr. Henson's Committee posted as to the progress of these studies.

There has been a lot of activity in the Number Services field and the surface is just beginning to be scratched. If the Industry is to reap the full benefits of Direct Distance Dialing it must make this service attractive to its customers. This can be done by keeping uniformity in mind so telephone service is easy to use and is a pleasant experience for the user. Number Services is Industry-wide in nature. It requires close coordination and cooperation between the Independent Companies and the Bell Companies in exchanging ideas and information. In working closely together it can be guaranteed that telephone customers will have all the advantages of the best service in the world. — *Richard A. Mathews.*



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These new Klein Replaceable Gaff Climbers assure maximum quality and safety. We recommend leg irons be replaced after three sets of gaffs have been used.

The easily replaceable gaff is held in position by a self-locking screw. Full impact is absorbed by the gaff and leg iron. No load is transmitted to the screw.

Adjustable to 14½, 15, 15½, 16, 16½, 17, 17½, 18, 18½ and 19 inches. Made in matched pairs, right and left. Available with triangular ring at ankle or riveted ankle loop. Aluminum finish. Every climber individually tested.

WRITE FOR BULLETIN 559

Bulletin 559, giving full information on Klein Replaceable Gaff Adjustable Climbers, will be sent on request.

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Serviceable for all around uses. Standard everywhere.
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Smooth texture, easy to handle. Preferred for switchboard use.
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Very popular because easy to keep clean. Moisture and grease proof.

Runzel CORDS
the WORLD'S FINEST

...for every purpose!
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Take your choice—Neoprene, Nylon or Cotton. They're all high quality cords made in accordance with Runzel high standard of quality. We carry large stocks of cords to meet every need. Our geographical location means Quick Service.

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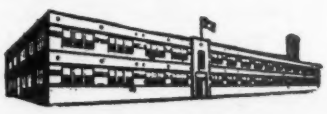
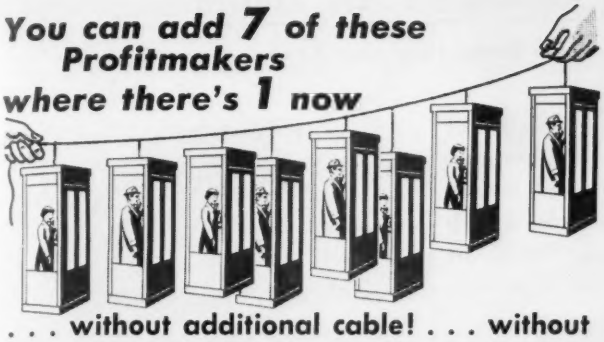


You can add 7 of these Profitmakers where there's 1 now



. . . without additional cable! . . . without more open-wire lines! . . . without impairing or interfering with existing service!

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Offers Seven Carrier Channels on a Single Physical Circuit — Existing or New

The ideal, low-cost way to provide additional *high-quality* postpay paystation service — where wire facilities are not available — where plant expansion for such facilities must be postponed — where additional seasonal postpay paystations don't warrant expensive plant installation.

- Low first cost — simple, with minimum components
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Dillon Dynamometers

eliminate the chance of human error in the following tests

- *Tensioning of wires*
- *Strength of insulators and cross arms*
- *Weight of cable reels and poles*
- *Effective holding strength of anchors*
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Dynamometer performing strength test on device used to lift equipment up poles

Now, through the medium of the Dillon Dynamometer, you can perform these tests ... precisely, with no chance of human error, and at a low, low cost.

For example, the Dillon Dynamometer will accurately check tension in a new line going up or in an old line standing *without cutting the wire.* We will be happy to supply illustrated literature and prices upon request.

W. C. Dillon & COMPANY, INC.

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VAN NUYS, CALIFORNIA

BI-SEAL

...THE ONLY SELF-FUSING POLYETHYLENE TAPE... IS MADE BY BISHOP

Now...only ONE tape for ALL drop wire splices...replaces time-consuming splicing methods requiring two tapes.

BI-SEAL IS THE ONLY POLYETHYLENE TAPE THAT IS...

- Self-fusing under its own pressure.
- Virtually non-absorbent (as low as .0065%).
- Unexcelled for cold weather applications (as low as -55° C).

BI-SEAL OFFERS...

- Proof... years of operational experience indicate much longer weathering life.
- More protection than the original insulation.
- High dielectrical strength (approx. 1000V/mil). BI-SEAL conforms perfectly to the most complex shape.

For complete information see your telephone supply distributor or Write today for Free Catalog on BI-SEAL and other quality BISHOP tapes.

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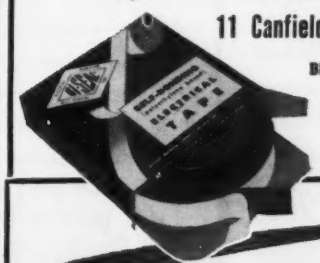
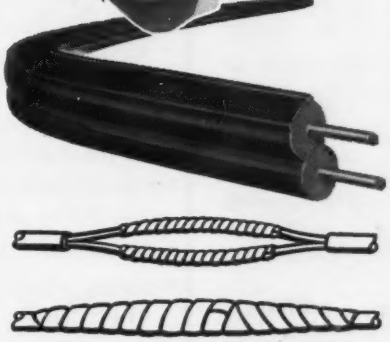
11 Canfield Rd., Cedar Grove, N. J.

BISHOP... MORE THAN A CENTURY OF ELECTRICAL INSULATION



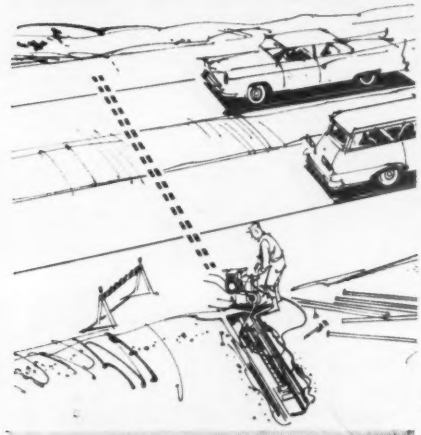
INDEPENDENT



PARALLEL DROP WIRE SPLICE

- Wrap with a single half-lapped layer of BI-Seal Type 2A.
- Tension Tape approx. 3/4 original width. Extend tape 1/2" beyond sleeve
- Completed Splice
- Write for copies of Bi-Seal Splicing Methods, Specification BM-1

EASY, LOW-COST WAY TO RUN PIPE UNDER STREETS AND WALKS



Greenlee Hydraulic Pipe Pusher

Traffic proceeds as usual when your piping for underground cable crosses under the street this simple timesaving way. Model No. 790 shown pushes ¾" - 4" pipe about two feet per minute with power pump. A small ditch in the parkway accommodates the pipe pusher — streets and walks remain undisturbed, total job time is cut to a fraction. Ask your supplier for details or write for free literature.

OTHER GREENLEE TIMESAVING TOOLS FOR TELEPHONE WORK: UTILITY CHISELS, POWER BITS, BRACE BITS, BELL HANGERS' DRILLS, ANGLE SCREW DRIVERS

GREENLEE TOOL CO.
1777 Columbia Avenue
Rockford, Illinois

GREENLEE

"North American Air Defense"

(Continued from page 53)

digital computer formed the core of the new air defense concept. Around this core, the scientists and technicians of Lincoln Labs wove a web which we now know as SAGE, or Semi-Automatic Ground Environment.

The use of computer techniques and related equipment gave not only very great improvements in speed over a manual system of air defense, but greater accuracy, reliability and capacity. With this electronic computer as the focal point for the SAGE system, methods and means were then refined for providing the computer with all the information necessary to the solution of the problem.

Inherent in this semi-automatic ground environment concept was the conviction that the system could be tied together from a communications standpoint. However, radically new and reliable methods would be needed to convert radar information into a signal form which could be transmitted over Class Two telephone circuits. Complicated data circuits would be required to pass the all-important computer instructions to the interceptor weapon. Automation was the key word, and I need not remind you of the headaches involved in this process.

The conviction held by the creators of SAGE that a suitable management system could be devised for the impending weapons developments, and be tied together communications-wise, was based on the existence of a network of commercial land lines and radio links that had no counterpart in any other part of the world. Without this, the SAGE concept would not have come into being.

As you know, the first elements of SAGE are now operational and the system is expanding rapidly. However, the one thing which is giving us the most concern at the moment is the vulnerability of the present and future networks to the explosive effects of megaton weapons.

Much has been done in this regard but much more remains to be done.

USITA Engineering Conference Speaker Colonel HOWARD S. GEE, Chief, Communications Systems Division, Air Defense Command, Colorado Springs.

Protection of the entire air defense system is our present objective. This includes constructing control and Direction Centers to withstand high over-pressures.

In certain cases, we plan the use of underground facilities. Sites are to be dispersed and their location within the primary industrial target areas must be avoided. All of this will avail us little if communications cannot be maintained between Control Centers and to the information-gathering devices, as well as the defending weapon sites.

The Problem of Protecting Communications Links

THE PROBLEM of protecting communications links is truly a nightmare. Nevertheless, we can help ourselves considerably through diversification and multiple routing of circuits, bypassing of large cities, and the protection of switching and terminal facilities. Station-to-station cross toll dialing will give us tremendous insurance of these respects when it becomes a complete reality.

The new air defense concept of operation is based upon getting the necessary elements of the system, vital to fighting a war, into a protected or hardened environment. This necessi-

tates the construction of Control Centers in underground installations capable of withstanding high overpressures. As you all probably realize, the cost per square foot of floor space is a very significant figure as compared with our present "soft" surface type installations.

A recent breakthrough in the state of the art for computers has made proceeding with the implementation of the SAGE Super Combat Centers practicable. This practicability is achieved through the reduction of equipment size, ventilation, power and space requirements for the computer and certain associated components through the application of modules and maximum use of solid state devices, miniaturization techniques, encapsulation techniques and ferroelectric devices to achieve small, highly reliable equipment.

The new solid state computer also makes it feasible to collocate the Federal Aeronautics Administration activities to provide a radar system for airways control at an early date.

It has been necessary for us to advise the common carriers and communication equipment manufacturers, in the provision of communications facilities for the SAGE Super Combat Centers, that every reasonable effort should be made to use equipment employing solid state devices and miniaturization techniques for communications equipment which of necessity must be located in these centers.

It was not considered desirable to establish rigid or unwieldy specifications at this time, but it will be necessary for the Air Defense Command to be critical of the use of vacuum tubes, electro-mechanical equipment and channelizing equipment having relatively heavy power, ventilation, space and manpower requirements compared with other equipment which can be provided in the time period available. In addition, to fully optimize this new concept, additional requirements are being imposed on the communications industry. These requirements can best be stated in the form of objectives:

(a) Communications channels provided for the SAGE system will be nominal 4KC channels and standard-

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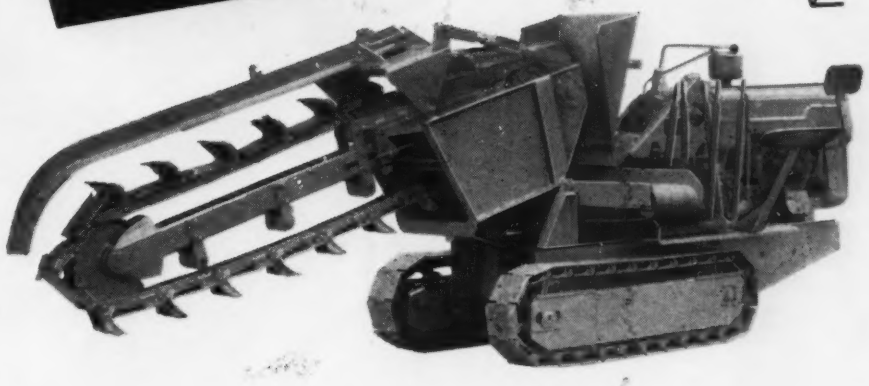

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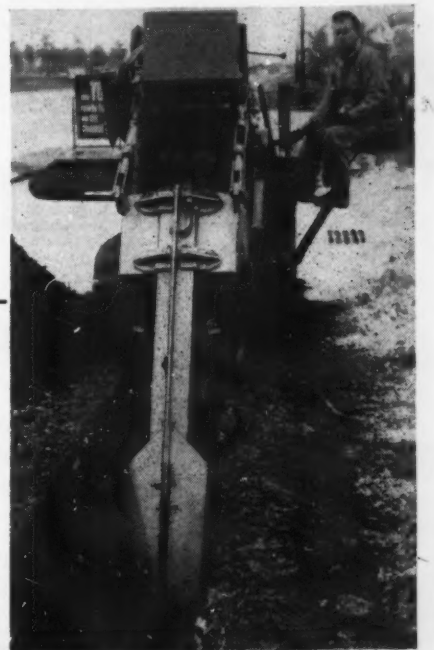

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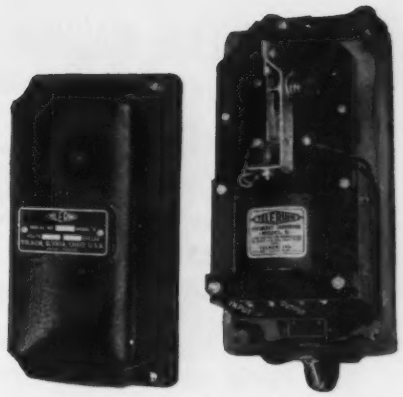

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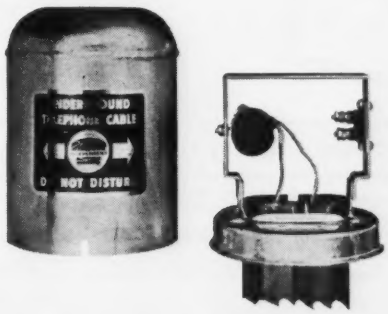

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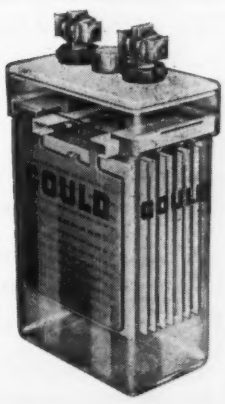

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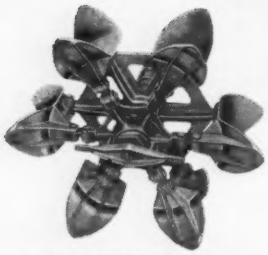

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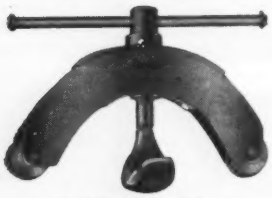

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ized for common usage throughout the system. The channels will be universally used for high speed teletype, voice, facsimile, graphics and digital data transmission.

(b) A fully automatic electronic switching system and control system complex. The switching center must provide automatic circuit and message switching capability on a four-wire basis for the reception, switching, relay and storage of all types of comunication, utilizing rapid electronic switching techniques. The switching center shall:

(1) Effect positive error control during the receipt, processing and transmission of binary and digital information.

(2) Permit inter-operation of various facilities employing different modulation rates.

(3) Maintain accessible records on a selected basis of all information processed.

(4) Utilize trunks automatically selected through channel switching techniques.

(5) Provide automatic dynamic testing to prevent catastrophic failure.

(6) Terminate channels which incorporate transmission security equipment.

The control system will provide for automatic, instantaneous restoration or rapid expansion of the network by automatic call-up of the civil communication facilities (Direct Distance Dial network).

(c) An improved Digital Data communications set capable of conveying synchronous digital data over telephone voice channels of nominal 4KC bandwidth, providing efficient use of frequency spectrum and improved performance in the presence of noise. The Data Communications set must be capable of working either on private line channels or channels which may be obtained by access to the nationwide direct distance dial network.

(d) Protection of the private line channels must be provided by avoidance routing or hardening of the facilities if they pass through critical target areas including both military and industrial population areas.

I am quite sure that by now you

are probably wondering what impact the integration of the Super Combat Centers into the SAGE system is going to have on the communications network which is presently being constructed. In general you may expect a reduction in the number of channels between installations, with requirements for dual-routed channels being reduced to an absolute minimum.

Dual routed channels will be limited to Ground Air Data Link facilities and to weapon installations. This general reduction of channels is made possible through the use of standardized universal, common user, nominal 4KC channels coupled with fully automatic switching equipment which I previously described as an objective.

This combination will provide maximum flexibility of the communications network which is not presently available in the existing SAGE network. Another improvement in the SAGE communications environment is the replacement of Frequency Division Ground Air Data Link facilities with Time Division thereby providing greater message capacity for control of weapons, while greatly reducing the requirement for Ground Air Voice, common user group trunks.

Action has already been taken to reduce trunking to five trunks in each of two routes where facilities are to be provided and the sector is initially scheduled for operation with Time Division Data Link facilities.

Here again due to the flexibility to be provided in the communication network through high speed switching, automatic restoration or expansion of the private line network channels through advanced call up of channels in the Direct Distance Dial network, the need for dual routing Ground Air Voice trunks is obviated.

Leased Services

FOR MANY years past, it has been a firm policy of the military departments to lease communications services from the commercial telephone companies. Associated Bell, Independents and Cooperatives have provided, and will continue to provide, leased circuitry for SAGE, as

Please turn to page 129

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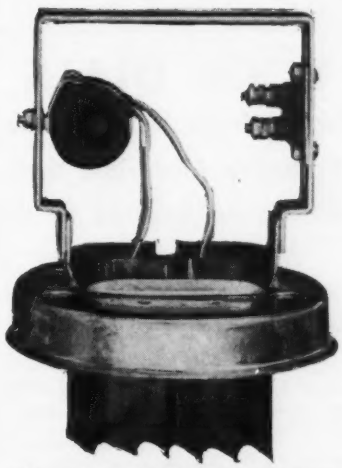

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NORTH ELECTRIC #5H6 — Desk Set. St. Line. Less Dial. $10.00 ea.

STROMBERG #1443 — Desk Sets. W/Dials. St. Line. $15.00 ea.

LEICH MAGNETO DESK SET, #901-1600 Ohm. $21.45 ea.

STROMBERG, #1248 — Desk Set Magneto. 1600 Ohm. $19.50 ea.

TELKOR-TELERING, Model H Ringing Machine. Reed Type. $5.00 ea.

SUBCYCLE. MODEL. B. $30.00 Small Model H. 75 — @$20.00 ea.

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REPEATING COILS

Kellogg #20-A	(New)	W.E.#94-E	(Recond.)
Kellogg #21-A	(New)	W.E.#94-F	(Recond.)
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S. C. #13-A	(Recond.)	W.E.#120-ES	(Recond.)
S. C. #11-A	(Recond.)	W.E.#120-GS	(Recond.)
A. E. #D-281596	(Recond.)	W.E.#93-F	(Recond.)

CONDENSERS
(Reconditioned)

Kellogg #128	2 x 2 MF	W.E.#437-A	4 MF
Kellogg #132	1 MF	#137-A	4 MF
Kellogg # 64	2 MF	#137-B	.02 x 4 MF
A. E. #D-6897	1 MF	#141-N	.02 MF
A. E. #D-6891	2 MF	#139-A	2 MF
A. E. #D-68258A	5 MF	S.C.#19	2 MF
A. E. #D-68012	½ MF		

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(Continued from page 125)

well as the manual air defense system until it is phased out.

The engineering for these leased facilities is an extremely complex undertaking. Technical standards must be adhered to rigidly. The web of existing communications in a specific local area must constitute an integrated whole, and we feel that the engineering for the entire system must be carried out by one agency.

It is logical and desirable that this agency should be the AT&T Company, inasmuch as all local points must ultimately tie into their long lines. This procedure does include and requires participation of associated Independent and cooperative telephone people. This also includes the manufacturers who make equipment for all concerned.

As engineering for each area is completed, installation and operation of the required facilities must be carried out by the local telephone agencies where SAGE operations are to be conducted. Obviously a great number of telephone companies will be concerned. There are over six hundred involved at the moment, and it is difficult to predict what the final number will be. Nevertheless, any company affected by SAGE will have an opportunity to provide the circuits in its area. A waiver in favor of another company can be made only if the franchise holder volunteers such.

While the opportunities to participate are open to all, I sometimes wonder if all concerned fully understand what is really meant by participation. To me participation means not less than complete cooperation with other involved companies. It means an unrestrained willingness to provide the best service possible. And it means full understanding that no one portion of the SAGE communications network properly engineered and integrated can stand in isolation, but must be a part of the ground environment system which we need so badly.

Having accepted the opportunity to participate, a company must share in the grave responsibility to make the system work efficiently and with the least cost to you and me as taxpayers.

The economic aspects of SAGE are highly significant. Commercial communications now in existence must be utilized to the utmost, if we are to avoid an excessively heavy burden for new construction.

Unfortunately, the existing circuits are not entirely satisfactory from a quantitative and qualitative standpoint, and certain additions and improvements will continue to be necessary. However, each addition and improvement must be given careful attention. To assist the personnel concerned with preparing and evaluating engineering proposals the following guidelines are expounded:

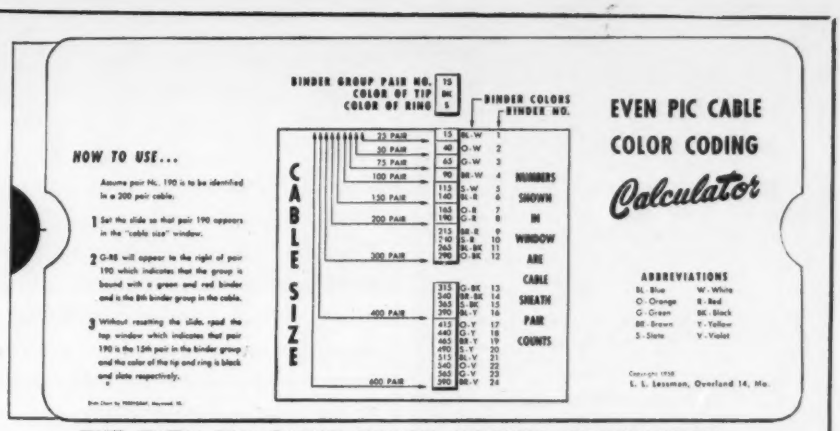
(a) In providing communications services for SAGE, an independent or rural cooperative telephone company should utilize to the maximum economic extent existing facilities within the service area, whether such facilities are owned by the independent or rural cooperative or by another communications carrier.

In addition, the company should, in engineering the required circuits, provide or arrange for the augmentation of such existing facilities by additional channeling equipment to furnish the required number and quality of channels, rather than undertake new construction or other expansion of facilities, unless the latter procedure would involve no greater cost (including contingent cost) to the government.

(b) In taking into account the maximum economic use of facilities, consideration should be given to both recurring and non-recurring charges. Where the nature of the cost to the government is difficult to evaluate, because there are both fixed recurring charges and potential charges for non-recoverable costs, such as contingent termination liabilities, the recurring charges should be given greater, but not exclusive, weight.

It would appear advisable, where it cannot be reasonably determined which of several methods of providing the required services would result in the least cost to the government, to give favorable consideration to the independent or rural cooperative company which is servicing the area in question, either under franchise, agreement or as a matter of past practice in view of the legislative history Public Law 968.

(c) If a communication carrier re-



THE EVEN PIC CABLE COLOR CODING CALCULATOR

Use this slide-chart Calculator to convert color coding of Polyethylene Insulated Conductor (PIC) cables into cable pair counts, or vice versa. You don't have to have a degree in engineering to operate this device. A housewife, with no knowledge of telephone cable can operate it.

To identify pair #190 in a 600 pair cable merely set the slide-chart and in less than 10 seconds the answer peeps through little windows. Amazing speed! Amazing accuracy too, because the windows are so arranged that only 4% of the data on the cables are shown at one setting.

Don't dig through pages of specifications when you can carry this spec. book in your shirt pocket. Order your PIC Cable Color Coding Calculators today at a cost of $2.00.

slide-chart *Calculators*

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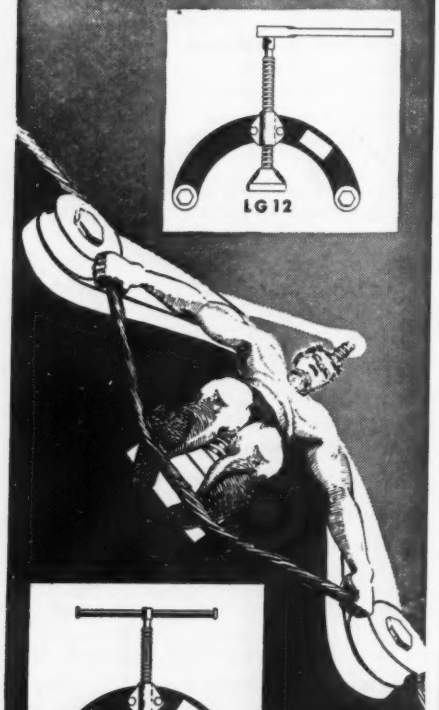
LITTLE Giant
SLACK PULLER

For pulling slack in a messenger you need a man with the strength of Hercules, the ruggedness of Atlas, the speed of Mercury . . . or a Little Giant Slack Puller.



If you need to pull slack in a messenger for any reason, either of the Little Giant Slack Pullers, the LG1 slip handle or the LG12 ratchet handle will do the job Quick, Easy and Safe.

WRITE OR PHONE

SERVING THE GROWING INDEPENDENT TELEPHONE INDUSTRY
CABLE SPINNING EQUIPMENT CO.

3100 TOPEKA AVE.
TOPEKA, KANSAS

(Concluded from page 129)

fuses to offer the most economic means of providing the service (for example, by insisting at government expense to expand its own facilities where facilities of another company to which the carrier can connect are available for use or may more economically be made available for use) orders should be placed with each of the communications carriers affected so as to obtain the required services at the most economical rate.

(d) The guidelines outlined above are to be followed when not inconsistent with the rules and regulations of public regulatory commissions or bodies having jurisdiction with respect to the services being procured. The foregoing guidelines are to be applied in the same manner to all communication carriers, whether large or small.

In conclusion, it cannot be overemphasized that the need is great for new ideas and means to reduce communications vulnerability. You must give the problem individual consideration because it is our country in jeopardy.

As the representative of the biggest single customer of the telephone industry, may I express appreciation for the splendid job that is being done in connection with the SAGE program. Without your efforts, we would have no Air Defense System Worthy of the name. — *Colonel Howard S. Gee.*

"Got my new truck today. How do you like that body?"

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BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*

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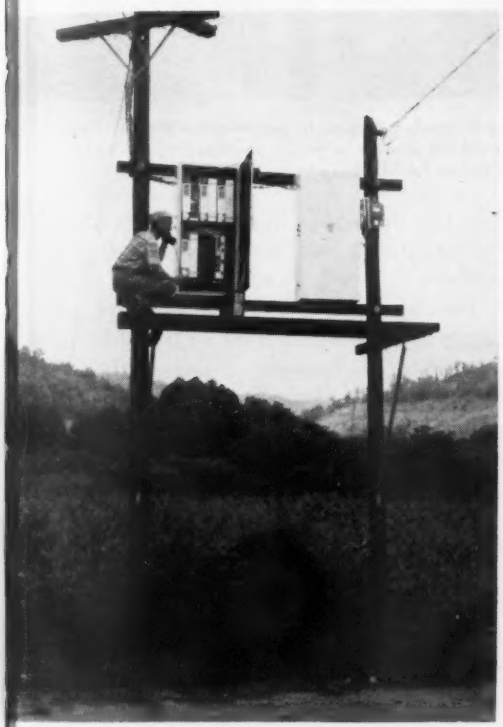
WIRE, Insulated Drop and Bronze or Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*

STROMBERG-CARLSON

Transmitter

A DIVISION OF GENERAL DYNAMICS CORPORATION

News and views of Independent telephone people. VOLUME 8, NO. 7 • OCTOBER, 1959



Woody Ferguson, maintenance man and installer for the Foothills Co-op, checks out the 561 Carrier units in the field. The units are wisely mounted ten feet high, to prevent tampering.

At Staffordsville, Kentucky,

hills are tall, expenses small

Stringing telephone wire in mountainous territory can send costs climbing higher than the mountains themselves. Nobody knows this better than Duell Williams, manager of the Foothills Rural Telephone Co-op of Staffordsville, in eastern Kentucky.

To keep expenses down while providing extra circuits for new subscribers, Mr. Williams recognized the advantage of Carrier. Under his direction, 15 channels of 561 Carrier have been installed for the Foothills Co-op, with the strong possibility of more to come.

Two pole box carrier units with a total of seven channels have been installed to meet growing demands on the Chapman, Ky., exchange. There are also three channels serving the Webbville area from the Blaine office and five from Staffordsville, serving subscribers in the Whitehouse area.

In all, the Foothills Rural Telephone Co-op has six exchanges. Besides those at Staffordsville, Blaine and Chapman, there are also exchanges in Salyersville, Fallsburg and Flatgap, Ky.

To provide maximum service, the Co-op cut over all of its exchanges to dial in 1956. In planning their expansion program, lines were built with the knowledge that carrier circuits soon to be added would make them economically acceptable.

Working with manager Duell Williams on construction of the frame were Paul Bailey, Bill Estop, Lowell Blanton and Fred Ross. Woody Ferguson installed the pole box carrier units.

It's not often Independent telephone people can sit back and relax. But with Carrier on the job for his company, Duell Williams is looking forward to more times like this.

The carrier installation crew takes a break after a job well done. From the left — Paul Bailey, Bill Estop, Lowell Blanton, Fred Ross, Woody Ferguson and Duell Williams, Foothills Co-op manager.

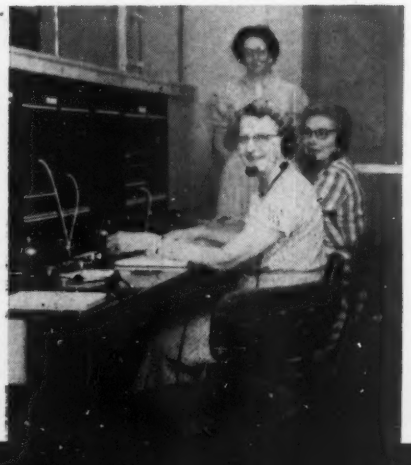
Everything looks fine in here, too. After checking out the carrier units in the field Woody Ferguson goes over them once more in the plant.

Cool, man, cool!

Sugar Land's new headquarters

Mr. Robert Hill, manager of the Sugar Land Telephone Co., Mrs. Hill and son Tommy.

Local equipment men Richard Myers and Jimmy McFadden strap in new lines at Sugar Land MDF.



Toll service locally handled. Mrs. Nola Hughes and Mrs. Helen Friend at board; Miss Mildred Rozelle, chief operator, standing.

It can be beastly hot in southeast Texas. But there is no mopping of brows, no handsets too hot to hold in the air conditioned booths on the portico of Sugar Land's new telephone headquarters. Pay station patrons are proving, by increased revenue, how much they appreciate this attention to their comfort by the Sugar Land Telephone Company.

The idea, while impractical at an open highway intersection, could well be adopted wherever booths are located adjacent to the air conditioning system of an office building.

"The booths were just a small part of the planning that has made our headquarters a model for its size," said Mr. Thomas L. James, president. "You see, this is the first time that the telephone operation ever had a building of its own."

The architect, Thomas E. Greacen II, and Southwestern Engineering Company — project consultants — made good use of a 1-acre wooded site for the handsome building, well set off by landscaped grounds and a curved drive for easier access.

This August more than 500 persons attended an Open House. Mr. Robert P. Hill, vice president and general manager, provided colored telephones and free long distance calls as door prizes. Visitors were equally impressed by the tasteful decorative scheme and the new XY® Dial equipment and toll board for the expanded system, which now serves 1200 subscribers.

Cool comfort brings in pay station traffic. Custom-built booths with air conditioning at headquarters building.

Telephone history in Sugar Land began in 1900 in a corner of the corrugated iron building housing the general offices of the Imperial Sugar Company. The Sugarland Industries at that time provided all community services.

Later — organized as the Harris-Fort Bend Telephone Company — quarters were found in the Engineering Building of the Sugar company. Just a year ago the present program was started with a substantial R.E.A. loan.

"The change in name to the Sugar Land Telephone Company," explains Mr. James, "is to properly identify the telephone company with community progress. The present expansion and modernization are in keeping with the company's traditions."

And well they may be proud! Mr. Thomas L. James, president of Sugar Land Telephone Co., and Mr. Robert Hill, manager.

Advertisement

From pushcart to push button,

a selling idea that lives on

"Bay-nan-nos, bay-nan-nos" was a familiar cry on our street years ago and many miles away. It was the "call letters" of the small but sturdy Italian fruit peddler as he pushed his cart and sold his fruit.

He came by every day, quite often without a single banana in the cart. But, with or without, you always knew he was coming by the announcement of his arrival — "Bay-nan-nos."

One afternoon I asked him about this curious bit of business.

"Why shout about bananas," I asked, "even when you don't have any to sell?"

He smiled and asked in return, "Who do you think of when you want bananas?"

"I think of you, of course."

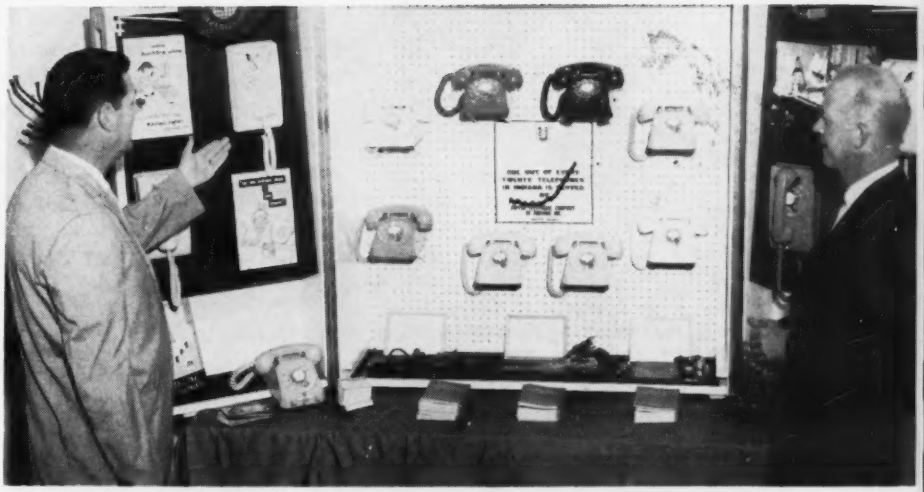
"That's why," he said. "You think of bananas and then you think of me because you know I am the banana man. When you want some bananas you come to me."

Why not tell?

This reasoning may seem a little cloudy at first, but take a deeper look and you'll see the sound business principle behind it. We, as Independent telephone people, also have a service to offer the public in addition to the things we sell. Why not tell the public about that service?

Many times the people are not yet ready to buy our product. When they are ready, we want them to come to us. The only way we can be sure of this is to keep telling them what we have to offer and how to contact us.

Because we are so familiar with our own products and services, we take it for granted that everyone else knows about them, too. This is not always true. In the hustle of daily living, people are apt to overlook many things, like telephone service, which play such an important part in their way of life.



United Telephone Company of Indiana, Inc. seized the opportunity to tell the public about its services and its products at a Chamber of Commerce display in Warsaw, Indiana. W. D. Saddler, left, Warsaw district manager of the company, is showing Jack Moltz, Jr., member of the Chamber of Commerce board of directors, the display. Through efforts like this, people are becoming more and more aware of telephone services.

Makes shopping easy

For instance, the quickest, easiest way to shop known to man (or woman) is by telephone. More and more department stores are playing up their order-by-phone service. Now it's time for the telephone companies to blow their horn, too. Let people know what a convenience telephone shopping is and how the telephone company makes it possible.

"What time does the movie start?" A phone call for a check on the time keeps your subscribers from walking into the middle of an Alfred Hitchcock thriller.

Making plane reservations for a summer trip or getting a taxi when the snow starts to fall, may both be done by phone. Think, too, of the time saved by calling for appointments with the hairdresser or dentist. In emergencies, the police, the doctor, the fire department are all as close as the nearest telephone.

In many areas, several novel and helpful telephone services are accepted as common things: weather information, shoppers' guide, World Series results, and even election returns. At Christmas time, the kids can talk to Santa right from their homes — by telephone!

The associations that all of us have made by phone must number in the legions — people whom we had met for the very first time over the telephone are now counted as lifelong friends. And to our teen-agers, holding handsets is the next best thing to holding hands.

It's always there

When was the last time your phone service went off? You may not even remember, because telephone service is almost as sure as the proverbial "death and taxes," and so much more pleasant!

Your own Independent telephone company may not provide all the services we have mentioned here. But it *does* furnish a great many of them or you wouldn't be in business.

So tell your subscribers and your potential subscribers what you have done and what you may be planning. *An informed public is already half sold.*

It's not crowded in here. Department stores all over the country, like Sibley's of Rochester, are providing order-by-phone service for their customers. Rochester Telephone Corp. was quick to join with the department store on this idea, thus increasing its service to subscribers.

One of the great strengths of Independent Telephony is the incentive of a continuous family enterprise. Father-son teamwork — at its typical best — in Arab, Ala.: Sid McDonald (standing) and L. D. McDonald.

Postman's Holiday No. 2

By way of introduction to the Postman's Holiday stories, these photos pin-point stops on the return route from the Gulf coast of Alabama.

Deep ruts from headlong tourists' tires turn your wheels toward a few of these towns. But most stand somewhat aside . . . and, because they have to be *found*, seem all the more rewarding. In the several years that your Editor has spent his vacation calling on telephone folks, he has yet to find the place that doesn't have a story with some new interest. This summer just proved that rule.

"Was that a mine we passed? . . . What do they make in that new factory? . . . All those cars pulling boat trailers . . . " It sometimes takes a little probing, but the story is there.

It may be about what happened when coal and iron were discovered side by side; how numerous small industries were lured by the personal enthusiasm (bordering on magnetism) of one telephone couple; the side

Zigzagging northeast: Alabam

In bygone days, people of Woodstock, Va., gathered at the town pump to exchange news publicly. They still come for conversation (private this time) in such numbers that Warren French added a second telephone booth.

We call them mountain folk — and count it a real pleasure that in "getting lost" in Tennessee we had a chance to visit and to know them.

Entire villages will disappear when this huge dam near the Leesburg (Ala.) office of the Peoples Telephone Co. is completed. Lake will furnish power, recreation and be a link in new navigation system.

Exciting progress about to get underway when this photo was taken at Canton, Pa. In doorway of dial addition, Larry Reinhard, plant manager, checks in XY Dial equipment with Bill Powers, Stromberg-Carlson foreman. Canton, having recently attracted new industry to town is experiencing a substantial boom.

"Other interests notwithstanding, my greatest pride is to say I am Mrs. Milton Stewart, wife of the manager of the Cornelia Telephone Company." This couple radiates enthusiasm for this arrestingly beautiful section of northern Georgia.

Microwave laughs at mountains that previously had blocked all attempts at inter-exchange network. Toll retained will justify the 56 channels of 511 Multiplex. This is Sylva, N. C., terminal of Western Carolina Telephone Co.

effects of super-secret defense activity in an already crowded neighboring town. Or, again, how Nature is now being "exploited" for its beauty instead of the depleted natural resources. And how do you assimilate a 1-million-acre lake now being created on your doorstep?

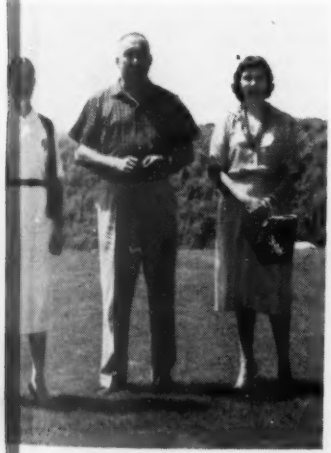
Everywhere the telephone company is in the thick of it — modernizing, extending, advising, promoting — and, more often than not, the bellwether of community progress.

Pennsylvania

Adding new entrance cable becomes a challenge in an office as large as Kingsport, Tenn. — now 9,600 lines. C. E. Lana, on ladder, is one of group working under Stromberg-Carlson foreman Lloyd Camp.

Floyd is beautifully situated in Virginia's Blue Ridge Mountains. Without a railroad and only one small factory, it nevertheless has attracted and held families who build gracious homes such as this one — selected for a cover story by one of the best-known "shelter" magazines.

A man could stand or lie at full length in bucket of giant scoop shovel in this coal mine near Oneonta, Ala. R. C. Corr, Jr., also took us to an iron mine just a few miles away; combination has built Birmingham and surrounding towns.



Ed Filler, president of the United Utilities of West Va., with Mrs. Filler (right) and Mrs. Gerald Parks, wife of president of the Duncan Telephone Co. Background is Blackwater Falls State Park, near Davis headquarters.

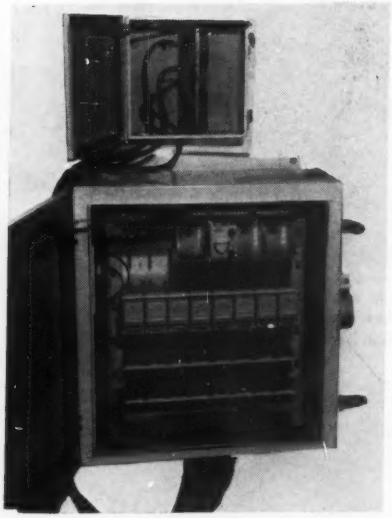
Discussion would be top level as Mr. John Sexton, vice president of the Inter-Mountain Telephone Co., drops in at the office of Mr. A. E. Reynolds, assistant vice president and treasurer. Bristol, Tenn., is home base for operations of this leader among Independents.

Mr. W. L. New of Commerce, Ga., Grant New, Mrs. New and a little charmer. Company has made great strides since it was assembled by Mr. New just 10 years ago.

Communications are vital to operation of large cotton mill in Canton, Ga. Mr. A. A. Fincher of the Canton Telephone Co. meets all their needs efficiently with an F-40 A Dial PBX.

At the convention:

541 Repeater dons new outdoor garb — New Data Link speeds D D D service



New outdoor housing for 541 Negative Impedance Repeaters. Four shelves of 8 repeaters with associated power supplies can be accommodated in this box designed for crossarm mounting. Smaller box, normally mounted on reverse side of crossarm, is for termination.

The 541 Repeater is steppin' out — in a weatherproof suit.

What is it? Well, you can sneak a peek right on this page. But to get the whole picture on how this new repeater housing can be used profitably in your exchange, see it at the USITA Convention or check with the Stromberg-Carlson man in your area.

You'll want to take a close look because this new housing provides compact, economical storage of the transistorized voice frequency repeater at the electrical midpoint of the line where it is most efficient. 541 Negative Impedance Repeater applications are thus expanded to cover the field more broadly.

* * *

A revolutionary new approach to data transmission, with a bit rate in excess of 400 per second, has been in operation for some months in the toll ticketing network of the Western Reserve Telephone Company, Hudson, Ohio. Similar equipment has been ordered by other leading Independents in Pennsylvania, Florida and other locations; a working system is being demonstrated in the Stromberg-Carlson exhibit rooms.

The Data Link is an "omnibus" system, which can be thought of as "carrying many messages." This means that the link can tap off up to 15 tributaries *without adding new channels*, as has been necessary in data links available up to this time. Each tributary can seize the line (or be seized) at any time on a common equipment basis, thus saving wasteful non-operating time and providing much more efficient use of the total facility.

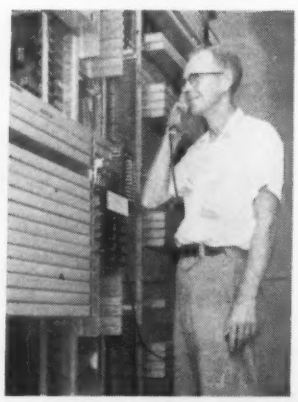
The Link, in addition to its greater speed and more favorable capacity-to-investment ratio, offers positive remote control, lower noise, and the transistorization of terminals. All circuitry is contained on plug-in printed wiring cards for improved versatility and easy maintenance.

These are just two of the attractions which — as always — make the Stromberg-Carlson exhibits the "most visited" at the USITA Convention.

Everybody's happy at Napoleon, Indiana

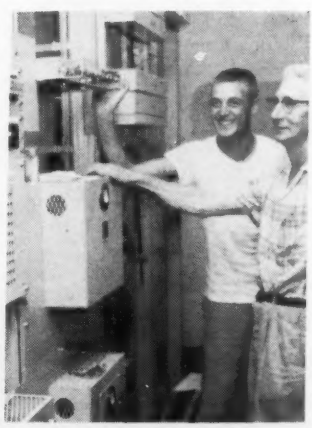
Starting with the townsfolk, they have shown their approval of the new XY Dial system by new orders for service as well as a higher calling rate.

The owner, Mr. Robert Miller, now has a 100% dial network, his other exchanges at Sunman and Alsace having already been converted. For his manager, Mr. Robert Miles, and Mrs. Miles the cutover called for a party — thoroughly enjoyed in this case by the "displaced" operator, Judy Kanning. As soon as she pulled down the last cord, Judy started working on her college wardrobe. Also happy, because of the good experience at Sunman, is combination man Earl Laker.



Robert Miles, local manager of the Napoleon exchange, now has the fine office he has hoped for.

Judy Kanning, operator, is happy to trade in the magneto switchboard for textbooks at Indiana University.



Mr. Robert Miller (right), owner of the Sunman Telephone Company, is pleased that now all his exchanges are dial. With Mr. Miller is Earl Laker, combination man.

Smithville Telephone Company grows 420% in less than three years

His initials are BAD, but his service is mighty GOOD.

We're talking about Mr. Byron A. Draper, owner and manager of the Smithville Telephone Co. of Ellettsville, Ind. As people around the Bloomington area will tell you, the name Byron Draper is synonymous with excellent telephone service.

Where there is good service, expansion is usually not far behind. The Smithville Telephone Co. is an ideal example. In 1957, the company consisted of four exchanges — Smithville, Ellettsville, Gosport and Stanford. These offices served about 1400 subscribers, less than 40% by dial service. Now, with nine additional exchanges, the company serves nearly 6000 subscribers, 70% through dial facilities. This is a subscriber increase of 420%.

Largest of the 13 exchanges is located at the famous resort town of French Lick in southern Indiana. French Lick is 102 years and one month old and is noted for the mineral springs located there. In fact, that is partly how it got its name: the first half from the French settlers, and the last from the animals that came to "lick" the minerals deposited by the springs.

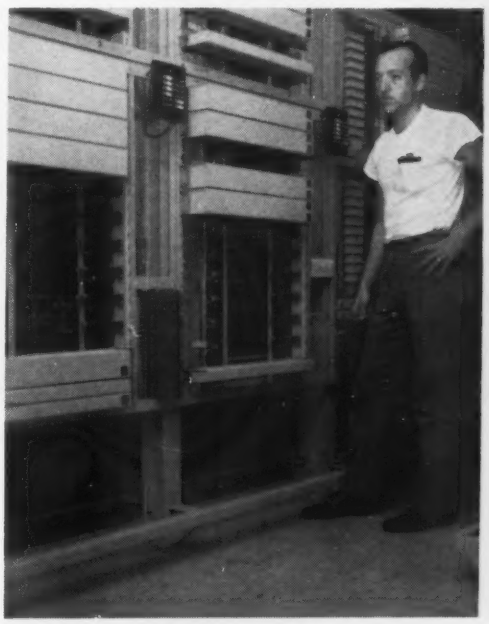
Also located at the resort is the French Lick-Sheridan, a hotel well known to the Independent telephone people of Indiana. The Sheridan has been the site of several conventions held by the telephone industry. It's also a favorite of vacationers from in and out of state.

The French Lick exchange was acquired by Mr. Draper less than three years ago from the Star Telephone Co. A short time later, XY Dial equipment was installed and the program of expansion through better service was well under way.

However, even greater expansion is expected. Mr. Draper plans to cut over the eight remaining manual exchanges at Sharpsville, Goldsmith, Lizton, Lyons, Switz City, Marco, Hymera, and Griffin, making the Smithville Telephone Co. 100% dial.

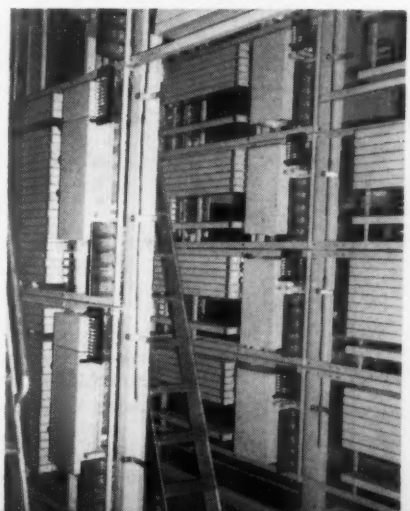
Mr. Byron A. Draper, owner and manager of the Smithville Telephone Co., seems pleased about his company's further expansion plans. In less than three years the number of subscribers served by Smithville Telephone has quadrupled.

Doesn't this look inviting! The famous French Lick-Sheridan holds many pleasant memories for Independent telephone people. A favorite spot for conventions, it's also a big attraction for tourists.



Jack Bledsoe, equipment man for Smithville Telephone, looks over the XY layout at French Lick.

Here is the heart of the French Lick dial exchange. Needless to say, telephone service here is expected to be good.



This modern office in Ellettsville, Ind., handles the billing for all Smithville Telephone properties.

Six ready, sixteen to go!

That was the story at the Texas Telephone and Telegraph Co. celebration of the cutover of three more exchanges to XY Dial. The conversion of the Ferris, Bristol and Wilbur exchanges brought the total to six such cutovers in Texas Telephone and Telegraph's continuing expansion program.

Fairfield, Lake Whitney and Franklin, Texas, have been operating with XY Dial service for some time. In all, 22 dial exchanges of this type are planned.

State and local officials were on hand to take part in the Open House festivities along with Mr. W. G. Winters, Texas Telephone and Telegraph president, his staff, and Stromberg-Carlson personnel.

Located in east-central Texas, the Texas Telephone and Telegraph Co. is one of the largest Independent telephone systems in that part of the country. Under the direction of Mr. Winters, it has grown until it now serves nearly ten thousand subscribers and prospects are bright for even further expansion.

W. G. Winters, president of Texas Telephone and Telegraph, foreground, tries his hand at pulling the picks with an active group of assistants.

The show must go on. During the festivities, operators maintain traffic flow while J. B. Swink, general commercial and traffic manager, shows interested guests from Southwestern Bell the new toll board.

State and local officials turned out for the celebration. Here are Miss Virginia Duff, State Representative, and Mayor Jim Adams of Ferris. Ray Jones, district manager of Texas Telephone and Telegraph, is at left and F. G. Winters, company vice-president, is next to Miss Duff.

Meet our new staff member

Tom Long

Did you spot a new, fresh slant to some of the lines in this issue? Chances are they came from the pen of J. T. (Tom) Long, now a member of the publications staff. Tom learned his journalism at Syracuse University (A.B., 1956), had the rough edges polished while on the staff of the Oswego (N.Y.) *Paladium Times,* chasing stories wherever they could be found.

After a 2-year service interruption with the U. S. Army Signal Corps at the Ft. Gordon cryptographic school and at Fontainebleau, France, Tom is enthusiastic about picking up the editorial reins once again.

A native of nearby Waterloo, N.Y., Tom Long was a member of the tennis and debating teams while at Syracuse University and worked his way up to Associate Editor of the "Daily Orange." During his residence in Oswego he joined the Junior Chamber of Commerce and was active in various community activities.

In his present position, Mr. Long replaces Mr. A. L. Carchedi, who has moved to new responsibilities in another division.

Transmitter

GEORGE B. FORBES, Editor

Published by the Telecommunication Divisio
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A DIVISION OF GENERAL DYNAM
Rochester 3, New York

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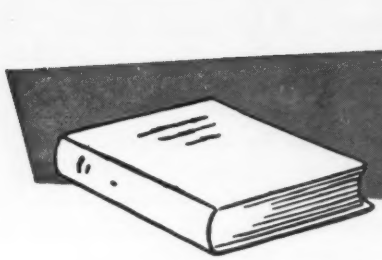


THE BACK OF THE BOOK

By JOHN G. REYNOLDS

"To Each His Own"

A MAN KNOWN as Wachickanoka asks for very little in life — just a mattress, a telephone and a few cold-blooded companions.

It sounds like a fluke, and it is. It's a recent stunt arranged by a local radio station in Oklahoma City. At this writing "Wachi," whose main claim to fame is his ability to withstand snake venom and underground living, resides in a home-made casket about three feet high placed in a 13 foot square hole. In the casket with Wachi are a mattress, 15 snakes, including diamondback rattlers and a boa constrictor Wachi likes to use for a pillow, and a phone by which he communicates with the announcers.

The Bell Telephone plant men who installed the phone said, "We made darn sure that we got the thing installed properly before it was occupied." Seems they don't share Wachi's fondness for snakes!

"Behind The Iron Curtain"

ANN LANDERS, lovelorn columnist, in writing of a visit to Russia, had this to say in her *Chicago Sun-Times* column about phone service behind the Iron Curtain:

"My [hotel] accommodations, for $35 a day, included . . . local phone calls (if you can get one through) . . . The phone on the night table was purely ornamental [as] there is no hotel switchboard. The dial looks like this: A, B, upside down L, a mah-jongg tile, E, two K's back to back, an N backward, K, and a Hebrew gimel. And Russian hotel rooms do not have telephone books. However, this is no great deprivation since the last Moscow phone book was published in 1951, and all numbers were changed in 1957."

Shell Game

WE UNDERSTAND a woman patron of a Denison, Texas movie theater who recently won a color telephone as a door prize had a bit of trouble when she visited the Southwestern Bell office to pick out a color.

The woman looked at the color shells in the office display but didn't express a choice. Then she left abruptly saying she'd come back later.

From there the prizewinner went straight back to the theater where she waylaid the amazed manager and indignantly told him she wanted no part of his free color telephone — because it *"didn't have anything inside to make it talk."*

When Silence Is Golden

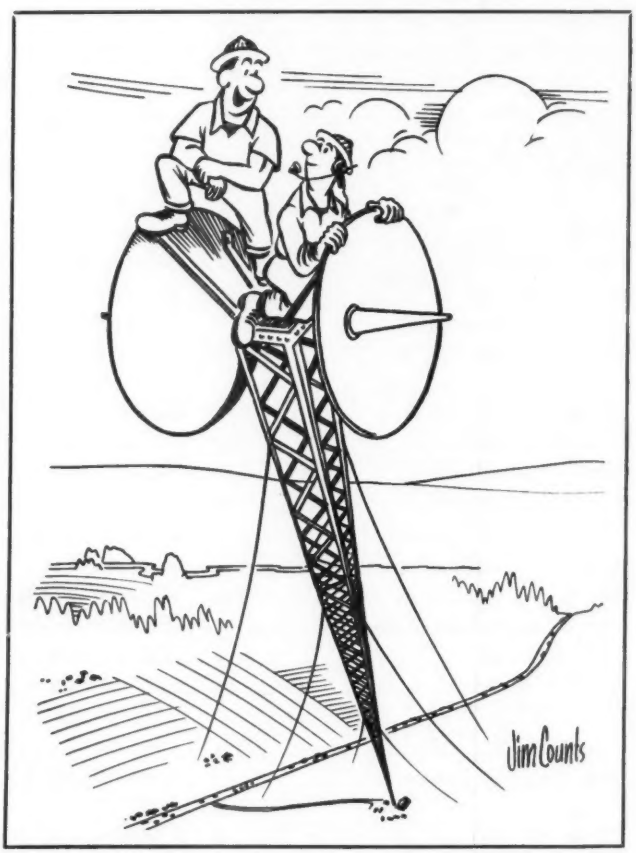
ACCORDING TO Southwestern Bell News, a writer in the Mart (Texas) Daily Herald recently pointed out that telephone companies overlook one important point in their programs to teach folks how to talk on the phone — namely, when to *quit* talking!

He went on to say that according to his calculations, "it takes 664 calls, tying up the line 5,312 minutes to round up 50 women for one ice cream social."

Counter-Trend

IN THIS day and age of steadily rising prices and not-so-slowly "creeping inflation" it is comforting that modern technology permits a few price decreases.

The telephone industry can be proud that one of them is long distance phone calls. Forty years ago a New York-San Francisco call cost $16.50 for three minutes, station to station. In 1939 the cost had come down to $6.50. At present it's only $2.50, and with the new rates going into effect it will be $2.25.



"Remember when we had to climb them telephone poles?"

NEW MOTOROLA PUSHBUTTON RADIOTELEPHONE

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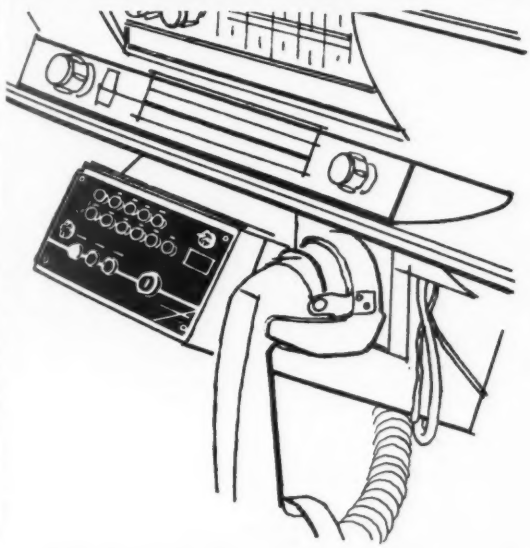

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